THE HEALTHY HOME AND COMMUNITY

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MIDDLE-AND-UPPER-GRADE SERIES

Growing Big and Strong

Safety Every Day

Doing Your Best for Health

Building Good Health

Helping the Body in Its Work

The Healthy Home and Community

"

THE HEALTHY HOME AND COMMUNITY

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TO THE READERS OF THIS BOOK

A great French writer named Victor Hugo said, "There is one thing that is greater than armies and that is an idea whose time has come." The idea of home came to the people of earth long years before the dawn of history. From that day to the present this idea has been stronger than armies. It has settled vast continents and turned wildernesses into pleasant farmlands and made "the desert blossom as the rose."

The adventurers and the explorers who return to the homes whence they came leave few traces behind them. The forest and the sand and the snow close over the paths they have made, and it is as if they had never been there. But set homes down in a forest or a tractless waste and see what happens!

In some of the old Norse stories called sagas there is evidence that the Norsemen discovered America five hundred years before Columbus did. But they were not able to establish homes and so the knowledge of a "strange beautiful land" far away in the direction of the setting sun became only a dim and wistful memory. Even after Columbus brought back to Europe the news of the land he had stumbled on in his search for a westward route to the rich cities of the East, many years went by before men and women and children began to speak and to think of this land as "home." For more than a century the hardy sailors of many nations came to the new continent of North America in search of gold or adventure or new trade routes. But although here and there small settlements were made, it was not until the early part of the seventeenth century that several small groups of people cut all ties with their old homes and set out with the fixed intention of making America their homeland from that time forth.

The first English colonists, all men, sailed in three small sailing vessels for Virginia in December, 1606. They were many months on the way and suffered terrible hardships. In May, 1607, they reached a peninsula about thirty miles from the mouth of a great river which they named the James. Here the colonists went ashore and built a fort and huts to live in and a church.

This small town, called Jamestown, was the first permanent English settlement made in the vast wilderness which was some day to become the United States.

On December 21 in the year 1620 a little sailing vessel no bigger than a fishing boat crept timidly into the harbor of Plymouth. On board, not counting the sailors, were about sixty-five men, twenty-five women, and two children. They had brought with them from England seed grain and tools for tilling the soil, guns and powder for hunting and defense, and axes for building shelters. With these things they proposed to build up from forests inhabited by savages an entirely new world for themselves and their children.

In the next few years many more English people came to America. As the years passed, little clusters of homes that we call colonies sprang up along the Atlantic Ocean from Maine to Georgia. Most of the colonists came from England, but settlers from many other countries also helped to build colonies.

To the north in the country now called Canada, to the west in the flowery land of California, in all places where the sea meets the land, pilgrim ships followed after the ships of the explorers. Slowly the forests and the deserts were conquered—not by the pathfinders, although their work was necessary, but by the homemakers.

Americans today are still building new homes and improving the old ones. When we think of how much of our lives is spent at home, we realize that the kind of home we have has much to do with happy, healthful, successful living. But no home can shelter its family under its wing away from all other people. In order to protect the home it is necessary also to procure and to maintain healthful surroundings, to provide for pure water and food supplies, to get rid of wastes, to control the spread of communicable disease, and to educate people in the principles of healthful living. The individual, the home, and the community must all work together in order to enable every citizen to realize his birthright of health and long life.

THE HEALTHY HOME AND COMMUNITY

UNIT I

Shelter, Heat, and Light

Up to now no one has been able to do anything about the weather. The sun shines, the rain and snow descend, the wind blows on the "just and unjust" alike and without regard for the health or comfort of any man. The shelter is the result of man's inability to control the weather.

Even in prehistoric times the earth was scattered with a great many human shelters which differed according to climate and the building materials found handy. We do not know all the details of home-building from that time to this. But we do know that from the beginning of recorded history people left behind them songs and stories and customs and pictures and tools and ruined buildings which tell us what kind of shelters and heating and lighting arrangements they had in different periods.

Some boys and girls live today in houses their parents or grandparents built. Others live in houses or apartment buildings that were constructed only a short time ago. Although they now give the name of home to dwellings planned and built by others, they will one day choose and perhaps build their own homes. They will think of new ways to make homes more comfortable and more beautiful. But they will never be able to change the fact that a dwelling is first of all a shelter which must be heated and ventilated and lighted. For this reason it is well to know something about the development of the shelter and what has been learned so far about keeping it warm and airy and light enough for health and comfort.

DO YOU KNOW

How people learned to make bricks?

What advantages the average home in this country today possesses over a king's palace of the seventeenth century?

The greatest difficulty people had to overcome in connection with the building of fires in dwellings?

The accepted standard for the best artificial room temperature?

How to keep indoor air moist and in motion?

What is meant by air conditioning?

What the first lamps were like?

What is meant by a foot-candle?

Whether this lamp is giving direct, indirect, or semi-indirect light?

How to find out whether you are getting enough light for different seeing tasks?

THE SHELTER

The earliest homes probably were caves and hollow trees along the banks of rivers. In many caves traces have been found of the human beings who made their homes there thousands of years ago. But caves and hollow trees could not have been made very attractive dwelling places. They were dark and damp, and very often men must have had to fight with wild beasts for the right to live in them. Then someone discovered a way to make a substitute for a cave. This was the first house.

Until ways were found of transporting building materials from one place to another, people built their houses of the materials within easy reach. In warm climates tree branches woven together and covered with leaves and grass and bark made satisfactory shelters. The Indian wigwam is a home of this kind. Nomads who wandered about from place to place learned to make a portable framework which they could carry about and set up and cover with animal skins wherever they wished to spend a few days. This shelter was the ancestor of the tent.

The people who first settled in Mesopotamia, the country between the two rivers Tigris and Euphrates, probably daubed with wet clay the round huts they made of the giant reeds growing on the river banks. The mud dried quickly in the sun and became very hard. After a while the people learned to make the clay into square blocks and let it dry. These sun-dried blocks were the first bricks.

With the invention of tools for cutting, shaping, and lifting, and of vehicles for transporting heavy loads, wood and stone became favorite building materials. The kind of houses built depended partly on the climate and the amount of space available for building, just as modern styles of architec-

" In prehistoric times many families lived in homes like these "

ture depend partly on these factors. When ground space is of no consequence, dwellings are likely to be low and spread out. When the ground space is limited, they shoot upward, nudging their neighbors on each side. The tenement house, or building sheltering many families, is not a modern invention. It was used in many an ancient city to take care of more people than could be accommodated in single houses within the city limits. But it was not until the strength of steel and the firmness of concrete were used in building that the towering skyscrapers of today became possible.

Shelters in Early America

When people came from Europe to settle in America, they left behind them the homes that the civilization of their day had developed. Many of them had to go back to primitive conditions until they could build better shelters. The first dwellings built by the early settlers were usually log cabins. Although they had no sawmills for cutting boards, or kilns for making bricks out of clay, or tools for quarrying blocks of granite, almost every settler had a woodman's ax. In building a log cabin the logs were spliced together at the corners, and the cracks between the logs were filled in with pieces of wood or daubed with clay. Straps of hide or wooden hinges were used to hang the doors.

As time went on the settlers wanted something better than a one-room log cabin. They copied their new shelters from the ones they had known in the homeland. Some of the houses they built are standing today. In various parts of the United States and Canada we may see how the English and French and Dutch and Spanish and Scandinavian settlers built houses like the ones they had known and loved before they set out to found new homes of their own. Do

The first step in building a home in pioneer days

you know which are the oldest houses in your town or city? From what European countries did most of the early settlers come? Can you find out in what ways the houses of these settlers differed from the dwelling in which you make your home?

Even the very finest homes which the early settlers left behind them in Europe could not compare with the average home in our country today. It was impossible then to keep even a palace fairly warm in cold weather. It is said of one seventeenth-century monarch that the food froze on the table in his dining room, and that his courtiers, if they wished to wash (which was seldom), had to break the ice in their water pitchers with ice picks. Windows were few and far between and only the rich could afford glass for

From a painting by E. L. Henry. Courtesy of Title Guarantee and Trust Co., N. Y.

A street in old New York.
From what country did most of the early settlers of this city come?

windowpanes. Mica, oiled paper, and transparent shells were used instead of glass, and in some of the more humble dwellings there was no way of closing a window except with a wooden shutter. At night lighted candles could banish only a few square feet of darkness, and many thousands of candles and torches were needed when a king or a great lord gave an evening party. Today we have ways of heating, ventilating, and lighting our homes that kings would once have envied.

HEATING AND VENTILATING

Some method of heating a shelter in places where the weather gets cold for part of the year is almost a necessity for the existence of human beings. The human body is

continually manufacturing heat from the fuel foods it receives, but when the surrounding air is cold the heat escapes through the skin by radiation faster than it can be produced. For this reason clothing is necessary to keep heat from escaping too fast. In cold climates dwellings must be artificially heated to warm up the air surrounding the body. If this is not done, the temperature of the body may fall so low that death will result.

Probably the first step forward taken by the human race was the discovery of how to use fire for heating and as a defense against wild beasts. So important was this discovery that some of the earliest myths of people of all lands are stories that were made up about the discovery of fire and its uses and dangers.

How men learned the use of fire we do not know. Probably they first got fire from a tree struck by lightning. Then they learned to make fire for themselves when they noticed the sparks that flew when they chipped stone flints to make arrowheads and spearheads.

Fireplaces and Stoves

The cavemen built fires near the openings of their caves to let the smoke out and to keep wild beasts from coming in. The first fireplaces had no chimneys. They were round and placed in the center of the dwelling. Smoke escaped as best it might from a hole cut in the middle of the roof. Even today there are no chimneys in many of the single-room adobe huts of the Indians of the Southwest. The irritation of the eyes from smoke makes these people susceptible to trachoma, a communicable eye disease.

In many cities today the smoke which pours from the chimneys of factories and other buildings is a menace to health. The irritation of the nose, throat, and lungs from

Making a fire in the days before history.
What method is being used?

smoke in the air makes people susceptible to colds and other respiratory diseases. Smoke and gases in the air also filter out the ultraviolet rays of the sun, which are beneficial to health because they enable the body to manufacture vitamin D. Many cities are trying to remove the smoke menace by making rules to secure the more complete burning of fuel in power plants and factories.

Fireplaces built against the wall with chimneys to carry off the smoke were first used in castles built in the thirteenth century. In 1744 Benjamin Franklin invented an open iron stove which could be set out in the room away from the chimney. This was a great improvement, as much more heat could be obtained with the burning of less fuel. An open fire is the most expensive method of heating a room because most of the heat goes up the chimney.

In course of time Franklin's iron fireplace was developed into the box-shaped cook stove for the kitchen and the heating stove for the living room. But just as fireplaces as heating devices were replaced by stoves, so stoves are now being replaced by central heating plants.

Central Heating

We may think that central heating is an entirely modern invention, but nineteen hundred years ago Roman engineers had worked out a system for heating from a central source the rooms in the public baths and in the more luxurious private homes. Hollow spaces were left under the floors of rooms and in the walls through which hot air from a furnace passed.

But during later centuries when the barbarians of the North and East, who despised the softness of the Romans, had wrecked Roman civilization, the art of heating a whole house to an even, comfortable degree of heat was lost. American engineers of the late nineteenth and early twentieth centuries discovered this lost art and perfected it.

There are several different types of central heating systems. In the hot-air system air is warmed by passing it over the heated surface of a furnace. It is then distributed to the various rooms by a system of large pipes. The heated air enters the rooms through openings called registers which are set in the floor or walls of a room and to which the pipes lead. The registers may be opened or closed to regulate the temperature.

In hot-water systems water is heated in a hot-water heater or boiler attached to the furnace. The heated water circulates through a system of pipes to radiators placed in the various rooms. In steam heating systems the water in the boiler is heated until it turns to steam and the steam is then circulated under pressure to the radiators. The fuel used in central heating systems may be coal, oil, or gas.

Room Temperature

The heating of homes and schools and other buildings is closely connected with problems of ventilation. In warm weather when artificial heat is not needed we keep our windows open to let in refreshing breezes, but when we are obliged to raise the temperature of a room we must solve these problems: What temperature is best? How can we get constant supplies of fresh moving air? How can we keep the air of a room moist enough? The temperature, humidity, and motion of the air in a room are the important things to consider from the standpoint of health and comfort.

Many experiments have been made to determine the best standards for the temperature of a room. Different individuals have different needs according to their physical condition, the amount of clothing worn, and the kind of work they are doing. An old person, for example, may need more heat than a young active person. If a person is exercising hard, his body is producing extra heat and he does not require so much artificial heat to keep warm. A boy or girl who is muffled up in a heavy woolen sweater may feel uncomfortably hot in a room temperature which is just right for people who have on ordinary indoor clothing. In regulating air conditions for a family or school group the only thing possible is to maintain a temperature and rate of air movement which most nearly meets the needs of the largest number in the group. The others by wearing more or less clothing may adjust themselves to these conditions. The usual accepted standard for the best artificial room temperature is from 68 degrees to 70 degrees Fahrenheit.

We can, of course, tell by our feelings whether or not a room is too hot or too cold. But it is not good sense or good hygiene to wait until we are wet with perspiration

or shaking with cold before we decide that the furnace or the stove needs regulating. The best method of keeping check on room temperature is to have a thermometer placed where it can easily be consulted. In many homes and schools there is a thermometer in each room. If there is only one thermometer in a home, the hall is the best place to hang it. The thermometer should not be hung near a window or a radiator, but in a place where it will register the average temperature.

In many modern buildings the temperature is controlled by a mechanical instrument called a thermostat. The thermostat is fastened to the wall of a room. It has a little thermometer in it. The thermometer may be set for 68 degrees. If the temperature goes above 68 degrees the thermostat shuts off the heat. If the temperature falls below 68 degrees the thermostat turns on the heat.

In many schools that do not have thermostats for regulating the temperature of the classrooms the teacher in each room makes the pupils responsible for looking at the thermometer at certain times and for keeping a record of the temperature noted each time. In case the thermometer shows that the temperature is above 68 degrees, a window is opened top and bottom or the janitor is notified to lower the amount of heat coming from the furnace.

Gendreau

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What information about room temperature ought this girl to use in setting the thermostat?

How to Keep Air Indoors Moist and in Motion

In the wintertime it seldom happens that the air in a room becomes too moist for health and comfort. Usually the air is too dry. Often it is drier than the air over a sun-baked desert. Air that is too dry takes up moisture from the plants, the furniture, and the bodies of people in the room. As a result the plants may die, the furniture may crack, and people's noses, throats, and skins may become dry and irritated. Irritation of the nose and throat makes it easy for a person to take cold. If the air in a room is too dry the temperature may have to be raised to 75 degrees or more before the people in the room begin to feel comfortably warm. The less moisture there is in the air the higher the temperature must be to maintain comfort.

An advantage of the hot-air system of heating is the possibility of adding to the moisture of the air by putting water into an evaporating pan above the fire box. If you have a hot-air furnace in your home ask your father to show you this pan. With steam and hot-water heating systems it is harder to obtain the right amount of humidity. One way of keeping the air of a room moist enough for health and comfort is to place an open pan filled with water on the radiator or on the back of the stove in each room. The pan should be

Coons

This boy is filling a water container called a humidifier before placing it behind the radiator. How is he helping to promote health and comfort in his home?

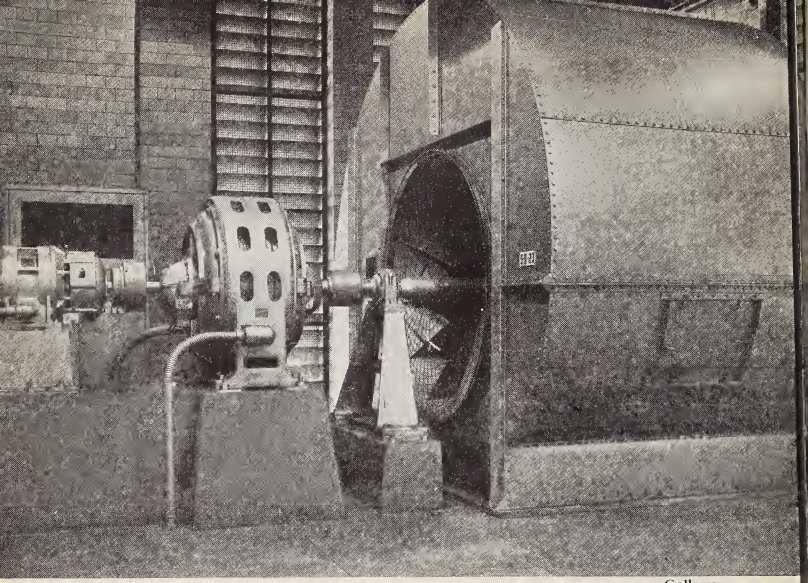
large enough to hold three or four gallons of water. Outdoor air usually contains the right amount of moisture. Letting fresh air into a room from windows opened top and bottom helps to keep the air moist.

Why does air in motion make you feel more comfortable than stagnant, or still, air? Heated air passes from your skin into the surrounding air. If the air in a room is not in motion the heat given off by your body is not carried away from the skin rapidly enough. Then you feel uncomfortably warm. Have you noticed how refreshing it is when a breeze springs up on a hot day in summer? Do you fan yourself on a hot day? The breeze or the air set in motion by the fan removes the heated air surrounding your body, and cooler air flows in to take its place.

Air may be kept in motion in a room by opening a window, top and bottom. Warm air is lighter than cold air. When a window is opened top and bottom the warm light air rises and passes out of the top part of the window, and the cool air coming in through the bottom spreads out in the lower part of the room where the people are. As this cool air is heated it rises slowly until it passes out of the top part of the window.

Air Conditioning

Many schools and office buildings and some homes have heating and ventilating systems which perform the whole job of keeping the air in the rooms warm, moist, clean, and in motion. A system of this kind is called an air-conditioning system. In these systems fresh air is drawn in from the outside and passed through a filter which strains out the dust. This clean fresh air is then heated, moistened, and fanned through pipes to the different rooms. The air enters the rooms through openings in the walls or floors.



Galloway

Air-conditioning machinery used in ventilating the Lincoln Tunnel, about one and one-half miles long, which runs under the Hudson River from Weehawken, New Jersey, to the city of New York

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To make room for this warm fresh air, a fan draws out the old used air through openings in the ceiling or high up in the walls. Thus the air in the room is kept always fresh and in motion.

In some buildings an air-conditioning system is used to cool the air in the summertime. Warm outside air is drawn into the building and cooled. It is then sent through pipes to the different rooms. Air-conditioning systems which cool the air in hot weather are now used in many theaters, stores, churches, factories, and even in some homes. Many trains are now air-cooled so that it is possible to travel in comfort in the summertime.

There is one danger to be guarded against in the use of air-cooling systems. People who enter a place very much cooler than the outside air may become chilled and so catch cold. Sometimes a person feels faint when he goes suddenly from a cool store or motion-picture theater into the very warm air of the streets. Many engineers now believe that the temperature of the air in an air-cooled place should not be more than 10 degrees below the temperature of the outside air. If you know that you are going to a place that is air-cooled when the weather is very warm, take along a light coat or sweater to wear until you become used to the cooler temperature. It is just as sensible to do this as it is to put on your coat when you leave a warm building to go outdoors in the wintertime.

LIGHTING

Primitive man must very early have noticed that the two round balls which lay on either side of his nose were what made it possible for him to see. He had only to cover these balls with his eyelids or his hands to shut out all sight of the world about him. He must also have noticed that as soon as the sun went down these balls were of no use. Seeing and light went together. Then when he had learned the uses of fire and brought it into his cave he found that he could see by the light of the branches burning on his hearth. Fire had brought him the gift of night seeing as well as the gift of heat. For countless years a torch made by thrusting a thick dry stick into a fire was the only means of illumination.

Even after man became civilized, torches made of woods containing oil, such as pine, were placed in metal holders along the walls to light the halls and stairways of castles. But the torch was not an ideal means of illumination, as it was smoky and gave an uncertain flickering light.

Then a better sort of torch was invented. Someone found that a wick of vegetable fiber, such as a rush or a reed, placed in a shell or a hollow stone filled with liquid fat, would burn until all the fuel was exhausted. This became the *lampas*, that is, the lamp, of the Greeks and Romans. Candles were invented later when it was found that a liquid fat, such as tallow, would harden about a wick. From the earliest times until the end of the eighteenth century fire burning on the hearth, torches, oil lamps, and candles were the only means of illuminating homes after the sun went down.

In the year 1726 an English scientist, Stephen Hales, announced that by heating coal he could obtain from it a gas that gave light as it burned. Other scientists and inventors thought it would be a fine idea if coal might be burned to light as well as to heat their houses. In 1792 one of them, William Murdock by name, heated coal in a kettle and piped the gas it gave off to a small iron tank. Over the end of an iron tube fitted in the tank he placed a thimble with a hole in it. He then lighted the gas escaping through the hole and found that he had a light by which he could read. Soon he was using gas lighting for his house and the factory where he worked. Later on coal gas became common as a means of illuminating homes and city streets.

Today coal gas is used much more for cooking and for heating than for illumination. In cities the gas range has largely taken the place of the kitchen coal range, and gas is used also as the fuel in many central heating systems.

No sooner had various inventors made serviceable gas lamps for home use than the last chapter in the history of lighting began to be written. The possibility of using elec-

The story of lighting. From cave fires to wicks dipped in oil, to wall torches, to candles, to kerosene lamps, to gas burners, and, finally, to electric lights

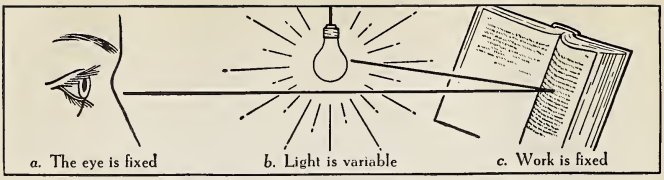
tricity for lighting purposes had been demonstrated in the first year of the nineteenth century by Sir Humphry Davy, an Englishman who invented the electric arc lamp. But the dream of electrically lighted homes could not come true until the dynamo should be perfected to the point where it could furnish electric current on a large scale and electric lamps could be distributed about the home as candles and oil lamps and gas jets were distributed. In 1879 Thomas Edison and his helpers after years of hard work succeeded in producing the incandescent-light bulbs which make possible the lighting of homes by electricity. Shortly afterward the perfecting of the dynamo made it possible to supply sufficient electric current for city lighting. Now great power plants with their humming dynamos send electric current over miles of wires strung overhead or underground to light homes and factories and streets in city and country alike.

Lighting and Seeing

Good lighting has a great deal to do with good seeing. Three things are concerned in the process of seeing: the eyes, the seeing task, and the light that makes it possible for the eyes to see. We cannot do much about the eyes themselves beyond protecting them from accidental injury and disease and overcoming defects in vision with the aid of glasses if the eyes need such aid. We cannot do much about the seeing task. If we have a book to read, a piece of sewing or writing to do, or a sketch to draw, the task is there to be done. We cannot change it. But we can control the light we use for the seeing task.

Our eyes cannot tell us promptly and accurately how much light we are getting, any more than they can tell us how much a person weighs simply by looking at him. In both cases

Making candles in pioneer days by dipping long wicks into liquid tallow



Of the three things concerned in seeing, which one can be controlled?

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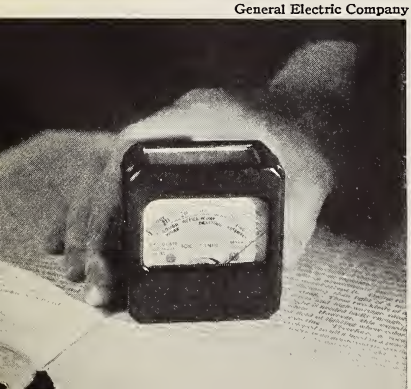
a measuring scale is needed. To measure intensities, or amounts, of light it is essential to use a light meter. A light meter measures units of light just as a scale measures units of weight. It does so in terms of the foot-candle, which is the intensity of light thrown on a perpendicular screen one foot away from a standard candle. You may find out roughly the amount of illumination supplied by a foot-candle by holding the page of a book upright one foot away from an ordinary candle.

Nature is very generous with light. On a bright summer day the sun supplies us with as many as 10,000 foot-candles of illumination. Even in the shade of a tree there may be 1000 foot-candles of light. In the shade of a porch we may find 500 foot-candles provided.

Inside the house there may be as many as 100 foot-candles of light near a window in the daytime. But at night it often happens that a room is lighted with a lamp that supplies only 5 foot-candles. No wonder that so

General Electric Company



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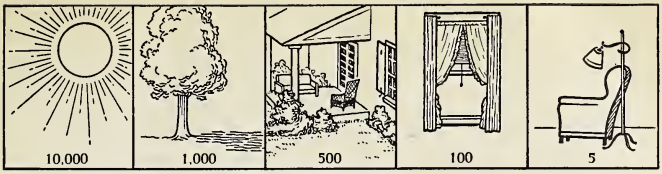
Using a light meter to measure the number of foot-candles of light supplied by a reading lamp



The figure under each small picture
tells the number of foot-candles of light provided

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many people nowadays are found to have defective vision. Scientific studies have shown that not only does poor lighting strain the eyes, but also that it takes away nervous energy from the whole body. For example, an office worker who uses his eyes all day in a poor light may be more tired at night than is a man who spends the day digging ditches.

Good Lighting and How to Get It

Various studies have been made to determine standards for proper home illumination. The first thing necessary is to have enough light for seeing the task to be done. This means having electric lamps of sufficient wattage throughout the home to make possible eye comfort and eye efficiency. As a general guide as to how much light is needed for a seeing task, scientific studies indicate that the amounts of light shown in the pictures on page 24 are desirable for certain occupations.

Light which shines directly on the eye task from a portable floor lamp or table lamp is called local light. The illumination of a whole room is called general lighting. Local light of the intensities shown in the pictures on page 24 may seem to be too bright unless the whole room is illuminated. In a shady place out of doors we do not find 500 to

Foot-candles	Occupation	
	50–100 or more	Very difficult eye tasks, such as prolonged sewing with dark thread on dark goods, fine penwork, reading very fine print
	20–50	Fairly prolonged and difficult eye tasks, such as sewing at a machine, fine mending, studying, drawing, working on a stamp collection, prolonged ordinary reading
	10–20	Moderate ordinary eye tasks, such as easy sewing on light goods, reading good print, writing, children's play, and housework
	Less than 10	Occupations that do not require close seeing, such as eating and conversation

1000 foot-candles of light centered all in one spot with the rest of the surroundings in darkness. We should try to get in our homes the diffusion, or spread, of light that we find in nature.

The amount of light throughout the entire room should be equal to at least one tenth of the local light directed on the seeing task. That is, if one is reading under a desk lamp that supplies 10 foot-candles of light there should be in the whole room at least one foot-candle of light. If the entire room is dark except for one bright spot on the seeing task the eyes must constantly adjust and readjust themselves as they glance back and forth from the work they are doing. The result may be eyestrain.

Artificial lighting usually is classified as direct, indirect, or semi-indirect. Direct lighting is furnished by a lamp with a shade which is open at the bottom. Most of the light from a bulb shaded in this way is directed downward. Indirect lighting is achieved by placing an opaque bowl under the light bulb. Light is then directed upward to be reflected from the ceiling and walls. Semi-indirect lighting combines both effects. The bowl under the bulb is partly transparent so that light is directed downward through the glass of the shade as well as upward through the open top. The color of walls and ceilings plays an important part in the general illumination of a room. Ceilings that are painted dull white, cream, or ivory help to increase the general illumination.

It is important to shade all bulbs, because the glare from an unshaded light is harmful to the eyes. The shade should be deep enough to cover the bulb, and the lamps should be so placed that the bulb beneath the shade is not in the range of vision from any point in the room. The inside of the shade should be almost white in order to reflect as much light as possible. The outside color is not so important from the standpoint of lighting and may be chosen to harmonize with the walls and furniture.

In general, every room in a house should be provided with one or more ceiling outlets to provide for the general illumination of the room. Switches for turning the ceiling lights

on or off should be provided at the main entrance to all rooms. This is a safety measure, as there is always a chance of accidental injury when a person must fumble around a dark room in search of a light button.

Convenience outlets are outlets placed in or near the baseboard for plugging in portable lamps, radios, vacuum cleaners, and all other electrical appliances used in the home. As the cord supplied with a portable lamp or an electrical appliance is usually about six feet in length, an outlet should be available within six feet of any point where a portable lamp or an electric appliance is to be used. By using duplex, or two-way, sockets one outlet may be made to do double duty.

In building a new house it is of course possible to make plans for the convenient arrangement of outlets for lighting and for the operation of electrical appliances. In homes already built it is often necessary to make the arrangement of furniture and the selection of rooms for certain purposes make up for the inconvenient arrangement of outlets. The furniture in each room should be arranged in relation to the lighting outlets and also with an eye to the activities which will be carried on in the room. In the living room, for example, the furniture should be so grouped that the people using the room will be able to obtain good local light for reading, writing, or sewing. In the kitchen, besides illumination from a ceiling fixture, special fixtures should be placed over work centers such as the sink, table, and stove. In placing the furniture remember that for reading the light should come from above over either shoulder; for hand work, such as sewing, writing, knitting, or ironing, it should come from the left to avoid a shadow of the hand on the work. For a left-handed person the light should come from the right.

"A well-lighted living room helps to protect the eyesight of the whole family"

General Electric Company

After deciding where portable lamps are needed for special purposes, the kind of lamp to use must be considered. The Illuminating Engineering Society has set up minimum standards for efficient lamps. These lamps bear the label "I.E.S." They are made by many manufacturers according to specifications of the Illuminating Engineering Society. Some of these lamps are designed especially for studying and reading. Some have bulbs that may be adjusted to three intensities of light simply by turning the light switch.

In order to get the most light and the longest service from bulbs, the voltage of the bulb should correspond to that of the electric current available in the community. For example, if the voltage in a community is 120, bulbs marked at the top "120 V" should be used. Mazda bulbs, frosted on the inside and not on the outside are the best. "Mazda" is not a trade-mark, but is the name given to a certain kind of bulb. When bulbs become old and dark, they use as much electricity as new ones but give less light. They should be replaced by new bulbs, and the old bulbs may be used in places where close work is not done, such as the hallway or basement. To obtain the most light the bulbs should be kept free of dust and dirt.

ARE YOU DOING YOUR BEST TO OBTAIN GOOD HEATING, VENTILATING, AND LIGHTING CONDITIONS IN YOUR HOME?

Do you have one or more thermometers in your home?

Do you use a thermometer as a guide in keeping the average temperature of the living rooms at about 68 degrees Fahrenheit?

Do you have some means of securing moisture in the air when your home is artificially heated in cold weather?

Do you open at least one window, top and bottom, to air a room when it is too hot or seems stuffy?

Do you know how to regulate the heat from your furnace or stove in order to maintain room temperature at about 68 degrees?

Do you open at least one window, top and bottom, before getting into bed?

Do you remove your outdoor wraps and overshoes when you come indoors in cold, wet, or snowy weather?

Do you adjust the light or the chair when you read or do other close eye work so that the local light comes from above?

Are you sure that the lamps you use for local light are supplying a sufficient number of foot-candles of light for each eye task?

Do you have general lighting in the room as well as local light when you are doing close eye work?

1. Choose the best ending for each of the following statements. (*Do not write in the book.*)

a. The heating device which gives the least amount of room heat per unit of fuel burned is · (1) a coal stove · (2) a fireplace · (3) an oil furnace.

b. The most important things to consider in the ventilation of a home are · (1) the temperature, humidity, and motion of the air (2) the amount of oxygen and the amount of carbon dioxide in the air · (3) the individual wishes of one or two members of the family.

c. The best way of keeping a check on room temperature is · (1) to hang a thermometer in the most convenient place · (2) to depend on the feelings of the people in the room · (3) to hang a thermometer where it will register the average temperature.

d. Units of light are measured in terms of · (1) foot-candles (2) volts · (3) watts.

e. Direct lighting is furnished by a lamp · (1) with an opaque shade under the bulb · (2) with a shade open at the bottom · (3) with a transparent shade under the bulb.

f. For studying, the following amount of local light is desirable: (1) less than 10 foot-candles · (2) 20 to 50 foot-candles · (3) 10 to 20 foot-candles.

2. Match each group of words or names in the box with the group of words in the list below the box that you associate with it. (*Do not write in the book.*)

Benjamin Franklin	William Murdock
primitive man	Stephen Hales
the Romans	Sir Humphry Davy
log cabins	caves or hollow trees
castles of the thirteenth century	Illuminating Engineering Society
	Thomas Edison

the first shelters of human beings
shelters often built by early American settlers
discovery of the use of fire
first fireplaces with chimneys
invention of the iron stove

invention of central heating
discovery of coal gas
invention of gas lighting
discovery of the electric arc lamp
invention of the incandescent-electric-light bulb
minimum standards for efficient lamps

THINK ABOUT THESE QUESTIONS

1. What are some of the reasons for the differences in dwellings in different parts of the country? For example, in what ways and why are New England homes different from homes in the South? Why do most of the people in large cities live in apartments while country people usually live in single houses?

2. How does the family group determine the choice of a neighborhood in which to live? For example, what would a family with children have to think of in choosing a home that a family of adults would not have to consider?

3. What are some of the advantages of having many windows in a home? What, if any, difference does the placing of windows make in the ventilation of a room? in the lighting?

4. Why is it important to know how much light you are getting from the lamps you use in doing close work? How is light measured?

DO THESE THINGS

1. (*a*) Select one of the following types of architecture and find out what you can about it in order to describe it for the class: colonial, New England, Dutch, Southern, Spanish-mission, modern, bungalow. Or (*b*) select from magazines pictures of houses you would like to live in, and tell why.

2. (*a*) Find in your school or town library a story about any one of the following characters and tell it in class: Agni, the god of fire in India; Vesta, the goddess of the common hearth at Rome; Vulcan, the Roman god of ironsmiths; Prometheus, the Greek hero who stole fire from the sun for the good of mankind. Or (*b*) read and report on one of the stories told by North American Indians to explain the discovery of fire.

3. Divide the class into sections and have each section report on a type of central heating in use today. The reports should include a description of how the system works, the cost of installing it, fuels, and the advantages and disadvantages of each system. Discuss this question in class: In purchasing a heating system for a home what should you need to consider besides the purchase price?

4. Draw a floor plan of a room 14 feet by 16 feet in which there is a convenience outlet 6 feet from a corner in each of two opposite walls and a ceiling outlet. The furniture in the room consists of two easy chairs, a davenport, a table, and two straight-backed chairs. In the room Father is reading the newspaper, Mother is darning stockings, a schoolboy is studying, and a five-year-old girl is dressing her doll. How shall you arrange the furniture in relation to the lighting? How many foot-candles of light should be provided for each seeing task, and how many foot-candles should the ceiling light supply?

5. Imagine that a family consisting of father and mother, schoolboy, and three-year-old child are looking for an apartment with four rooms besides kitchen and bath. Draw the floor plan of an apartment showing an arrangement of rooms that would meet the chief requirements for convenience and comfort in working, playing, and sleeping. Place windows and doors.

6. As a class project you may build a model of the kind of dwelling in which people lived in some period of history. To do this you will need to consult books which tell about the living arrangements in the period you have chosen. You may also need to get the help of your history and art teachers. The model should show the arrangements for ventilating, heating, and lighting the dwelling. Some interesting dwellings are as follows: the home of one of the early settlers in Mesopotamia; the home of one of the heroes who fought in the Trojan War, such as the home of Ulysses in Ithaca; a Roman house in the second century A.D.; a castle in the twelfth or thirteenth century; a log cabin of an early American settler; an Indian wigwam or adobe hut.

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

mica
trachoma
respiratory disease
central heating system
regulate
thermostat
air-conditioning system
illumination
incandescent-light bulb
intensity (of light)
light meter
foot-candle
wattage
local light
general lighting
diffusion
direct lighting
indirect lighting
semi-indirect lighting
convenience outlet
duplex socket
Mazda bulb

2. Tell the difference between the following terms:

trachoma and respiratory disease
central heating system and air-conditioning system
illumination and diffusion
thermostat and light meter
local lighting and general lighting
indirect lighting and semi-indirect lighting
convenience outlet and duplex socket

UNIT II

The Protection of Water and Milk Supplies

A shelter is not a home. It is simply a shell of wood or stone or brick or canvas or animal skins that protects people from the intense heat of summer and the bitter cold of winter and the unpleasant wetness of rainy or snowy weather. A shelter becomes a home when it becomes the fixed abiding place of one or more persons.

Many factors have entered into the changing of shelters into homes. One of the principal ones is the long time it takes a human baby to grow up into a self-supporting youth. In primitive days a snug safe shelter had to be provided where the family could be kept together until the young ones were old enough to start out in life for themselves. In those days this process took a much shorter time than it does now, but it was one of the ways in which people formed the habit of thinking of a shelter as an abiding place.

When people began to settle down and to have real homes, they usually settled in groups held together by ties of relationship and common customs. As soon as this happened all sorts of problems arose which communities have to this day. The most important of these problems was how to provide enough water to keep up with growth of population. Much later, when it was discovered that water and milk might carry the germs of communicable disease from the sick to the well, the purity of water and milk supplies became one of the chief concerns of every home in a community.

DO YOU KNOW

The story of the Broad Street pump?

Whether water that looks clean and sparkling is always safe to drink?

The three chief ways in which impure water may be purified?

Why clean milk is one of the best foods in the world and unclean milk one of the worst?

What is meant by speaking of a herd of cows as an accredited herd?

Why health authorities require the frequent medical inspection of men who milk cows?

Why milk should be kept at 50 degrees Fahrenheit or below?

How to pasteurize raw milk at home?

What part the pasteurization of milk has played in the protection of babies?

What the difference is between Grade A pasteurized milk and certified milk?

WATER SUPPLY

The first consideration of any community is its water supply. In the days when people had no settled homes the banks of streams largely set the course of man's wanderings, for water is so essential to life that people did not dare to wander too far away from a good water source. To this day an adequate water supply determines the growth of population in any community. Our very lives depend from day to day on the maintenance of an adequate supply of water.

The first settlements were near good natural sources of water. If for any reason this source failed, the people usually moved to another place. When a group of people refused to leave their homes because of the failure or inadequacy of a natural water supply and invented other ways of getting water, this was a sign of a coming civilization. Digging wells was the usual method of getting extra supplies of water. When a community became so large that wells were inadequate, water was brought into the city from a river or lake by digging canals. Huge cisterns also were built to collect rain water.

Later on water was brought to a city from a distance by aqueducts. When ancient Rome was at the height of her power, magnificent aqueducts were built throughout the Empire. It is said that in the city of Rome itself enough water was brought in by the aqueducts to supply each person with 375 gallons of water a day. With the decay of Roman civilization city water supplies became poor both in quantity and in quality. As late as the sixteenth century the pure-water supply of the city of Paris in France amounted to only one quart a day per person. In the seventeenth century it was only five pints. In London

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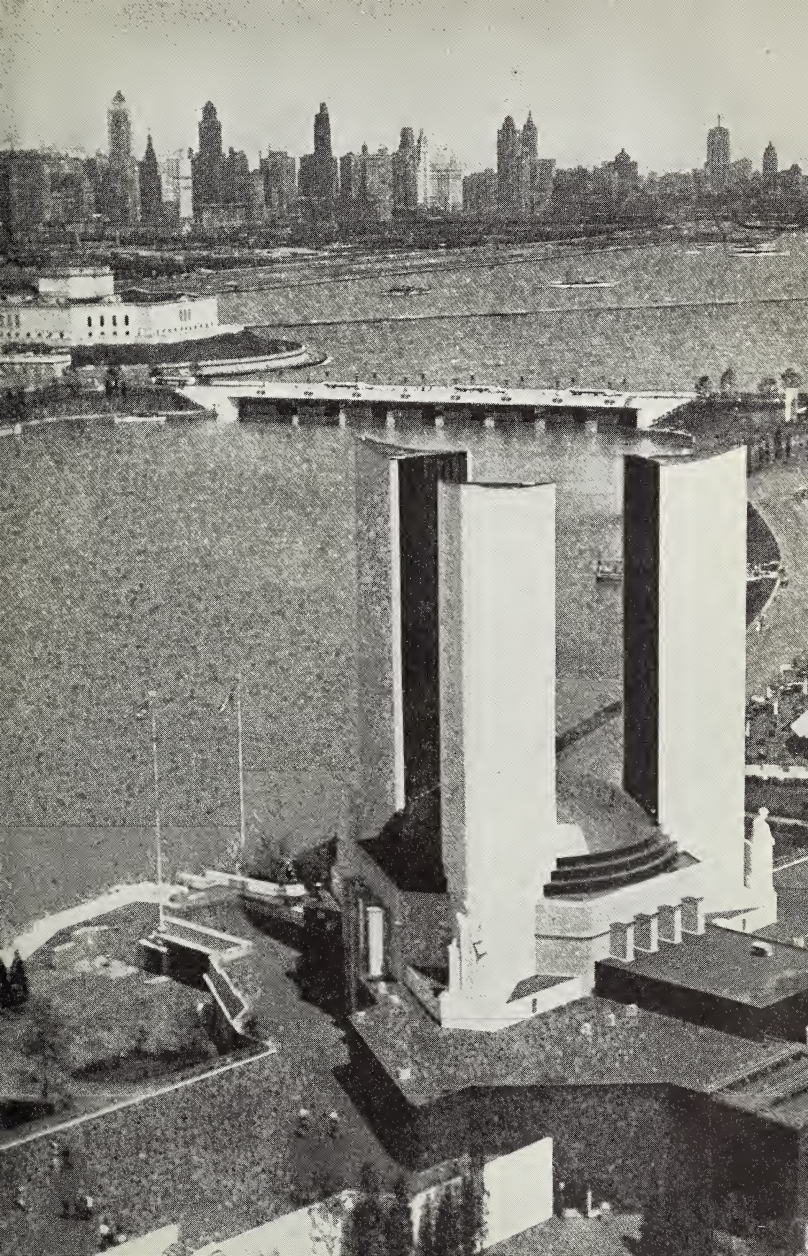
Why was the site of Chicago chosen as a good place for a settlement? What is one good reason for the growth of this great city?

Kaufmann-Fabry



water from the river Thames was peddled in the city streets to add to the water from wells and cisterns.

When iron pipes and steam-driven engines for pumping water were developed, our modern water systems began. In our cities we have surpassed the ancient Romans not so much in the quantity of water supplied as in making pure water quickly available in almost every home. Very few houses in Rome were supplied with running water piped in from the aqueducts, but in modern cities water is piped into nearly every building.

In communities and on many farms where there is no public water-supply system, each family must arrange for its own water supply. Drinking water may be supplied from a well or spring, and water for washing purposes from cisterns built to catch rain water, or from ponds or brooks.

The Dangers of Impure Drinking Water

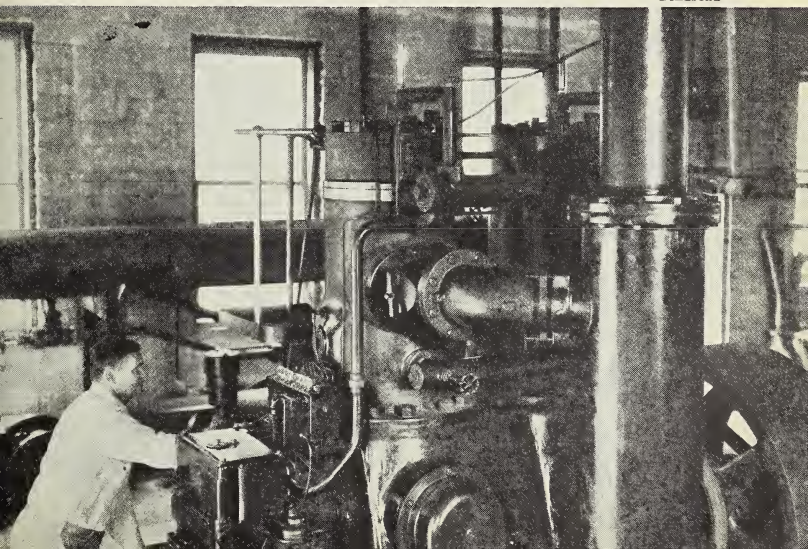
Besides getting enough water, the most serious problem to be solved in connection with water supplies is that of protecting them from sewage or human discharges which may be infected with the germs of communicable disease. Doubtless all through history polluted, that is, impure, drinking water was the cause of many outbreaks of diseases of the intestine, such as cholera, typhoid fever, and dysentery, but the connection between impure water and epidemics of intestinal disease was not definitely established until 1854. In this year an epidemic of cholera raged in the city of London. It seemed to have its center in the neighborhood of Broad Street. Although about seven hundred people died of cholera in this district there was little illness in adjoining districts. During an investigation made by a doctor named John Snow it was proved that nearly all the people who came down with cholera had used water

from a well in Broad Street. On September eighth the handle of this pump was removed, and shortly afterward cholera began to disappear.

Further investigation of the Broad Street well revealed that the mortar joints of the brick walls had crumbled. The main drain from a house at 40 Broad Street, which ran within two feet eight inches of the well, was also in bad condition. All the drainage from the house was seeping into the well. The start of the epidemic was traced to a case of cholera at 40 Broad Street. This was dramatic proof that water may be polluted with the germs of a communicable disease. What actually causes cholera no one could tell until Robert Koch, a German scientist, discovered in 1883 the comma-shaped cholera germ, and proved that it was present in drinking water and food and on clothing that had been polluted with discharges from the intestines of cholera patients.

A scene in the pumping station of a modern water-supply system

Gendreau



Another dangerous intestinal disease is typhoid fever. Many dramatic stories are told about how typhoid-fever epidemics were traced to polluted water. One of the earliest of these stories comes from the town of Plymouth, Pennsylvania. In 1885 one of the citizens of the town spent his vacation in Philadelphia. On his return home he came down with typhoid fever. His intestinal discharges were deposited near the edge of a stream which was the source of the town's drinking-water supply. When the spring thaw came the discharges were swept into the brook and so into the reservoir from which water was piped into the town. Within three weeks there was a widespread typhoid-fever epidemic in Plymouth. There were more than 1000 cases, and 114 people died. Only the people who drank the city water caught the disease. In one street the houses on one side had wells; no cases of typhoid fever developed in these houses. The

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Why is the well shown in this picture poorly located?

Keystone

Galloway

Examining samples of drinking water in a laboratory to find out whether the source of each sample is free of harmful germs

houses on the other side were supplied with city water; in these houses several cases developed.

The germ which causes typhoid fever was first seen under the microscope in the year 1880. The knowledge that typhoid-fever germs may infect drinking water and milk or other food has led to almost complete control of the disease. However, there are still occasional outbreaks of typhoid fever and other intestinal diseases when, through carelessness, a water supply is polluted. In the United States and Canada during the seven years 1930–1936 there were 203 outbreaks of intestinal disease caused by polluted drinking water. More than 26,000 persons were affected, and 365 died.

Protection of Water Supplies

The original source of all our water is rainfall. Falling rain is pure. It is only when it strikes the surface of the earth that it becomes polluted with dirt and germs. Surface water flowing into any place where water collects, such as a spring, well, brook, river, pond, or reservoir, may carry with it harmful germs. This is why it is important to protect from surface drainage all bodies of water that are used as a source of drinking water.

Wells and springs should be provided with tight close-fitting covers. Stables and outhouses should never be located in places where drainage from them may seep down into a well or spring or any other body of water used as a drinking-water supply. In general, a well should always be located on the highest ground possible. The water level in the well must be higher than any possible source of pollution such as barnyards, manure heaps, and outdoor toilets.

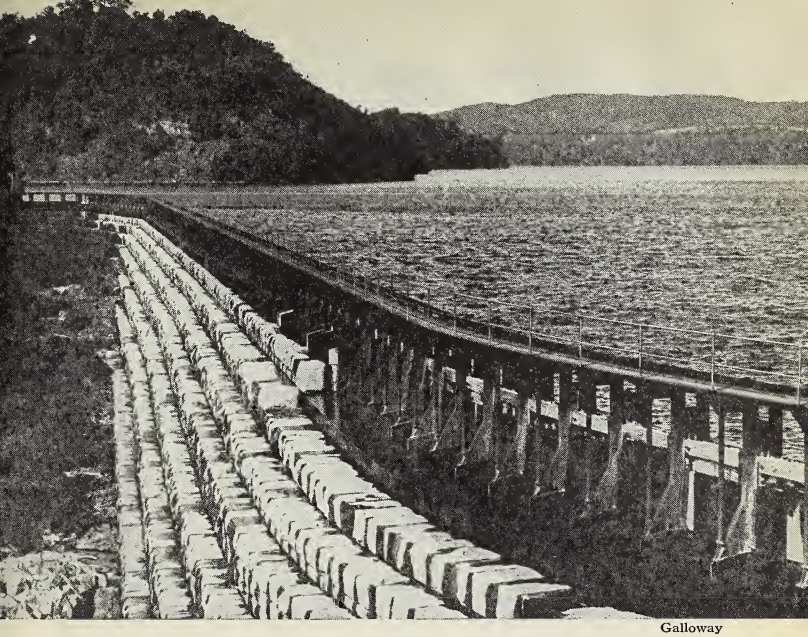
Water from shallow wells and springs should be tested at regular intervals. In most states the state department of health will examine samples of drinking water in order to determine its purity. It is well always to remember that just as all is not gold that glitters so all is not pure that looks pure or clear. Water that looks and smells clean may be far less pure, in the sense that it is free of germs, than water that looks and smells dirty. Unless you are sure that the water from a brook or wayside spring is pure you should boil it before drinking it.

With the growth of towns and cities the problem of getting an adequate supply of pure water became a community rather than an individual problem. This problem has been met in various ways. Some cities located near large bodies of fresh water, such as a lake or a river, pump water into the city from this natural source. Chicago, for example,

A feeling of responsibility
for the health and safety of others
is a mark of good citizenship.

How is this Boy Scout helping
to protect the health of his fellow campers?

KODACHROME BY STEVEN A. COONS



Galloway

Purifying water by storage in a reservoir

gets its water from Lake Michigan. Other cities construct artificial reservoirs and bring the water into the city by means of aqueducts. New York City gets most of its water from reservoirs in the Catskill Mountains, more than 100 miles north of the city. Whether the water piped into the city comes from a natural body of water or a reservoir, it is essential that the water be fit for drinking. This means that it must contain no harmful germs, that it must be clear, and that it must be free from unpleasant tastes or odors. It is desirable also to remove minerals that make the water so hard that soap does not readily dissolve in it. Purifying water so that it cannot be the means of spreading communicable disease is the most important work of those who have charge of a community's water supply.

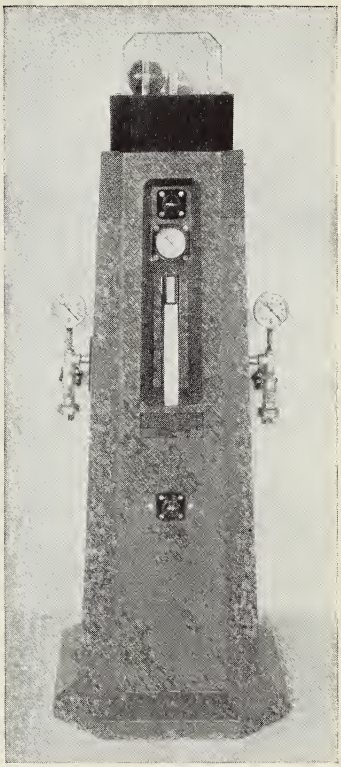
Purification of Water Supplies

The three chief ways in which water is purified are by storage, filtration, and disinfection. The storage method is based on the fact that bacteria cannot live in water for a very long time. As surface water drains into a brook and the brook flows into a large stream and the stream into a lake, solid materials settle out and harmful bacteria (which are used to living in the rich warm fluids of the body) will starve to death for lack of food. If no new pollution occurs, the disease bacteria will all be dead in two weeks or so. Storage in a natural lake or a reservoir is, therefore, a very good way of purifying water. However, the greatest precautions must be taken to guard such a body of water from pollution. No houses may be built around it, and notices are put up warning people not to pollute the water.

In case the water supply of a community is too polluted to be treated by storage, it may be purified by filtering it through sand. As water percolates, or passes through, the sand in a filter, bacteria are caught and held on the surfaces of the sand grains. The first sand filters were built in London in 1829. Since then filtration has been adopted by most cities that use river water. More than twenty-five million people in the United States drink filtered water.

Water which is fairly clear and is not too highly polluted may be freed from disease bacteria by chemical disinfection. This method of purifying water is valuable for use in emergencies when it is necessary to protect the public immediately from infected water. It also is used frequently in combination either with storage or with filtration. Chlorine is the disinfectant commonly used. Minute amounts of this gas will destroy disease bacteria without harming the water in any way. Usually the gas is fed directly into the water by a special device called a chlorinator.

The treatment of water to destroy or remove disease bacteria makes it safe from a sanitary standpoint, but sometimes it is necessary to remove offensive tastes and odors or to soften it. Objectionable tastes and odors in water may be caused by tiny plants and animals growing in the reservoir. These may be destroyed by adding a chemical to the water. The substances produced by animal or plant life which cause the water to have a bad taste or smell may be removed by aeration, that is, by exposing the water to oxygen by spraying it into the air.



Wallace & Tiernan Company

A machine called a chlorinator used for purifying water

The hardness of water is caused by minerals it has absorbed from certain kinds of soils. It is objectionable because it forms a crust of minerals inside furnace boilers and also because it requires the use of a great amount of soap to make even a poor lather. There is no truth in the theory that hard water causes gallstones, kidney stones, or other body disturbances. Many cities treat their water with chemicals in order to remove the minerals that make it hard.

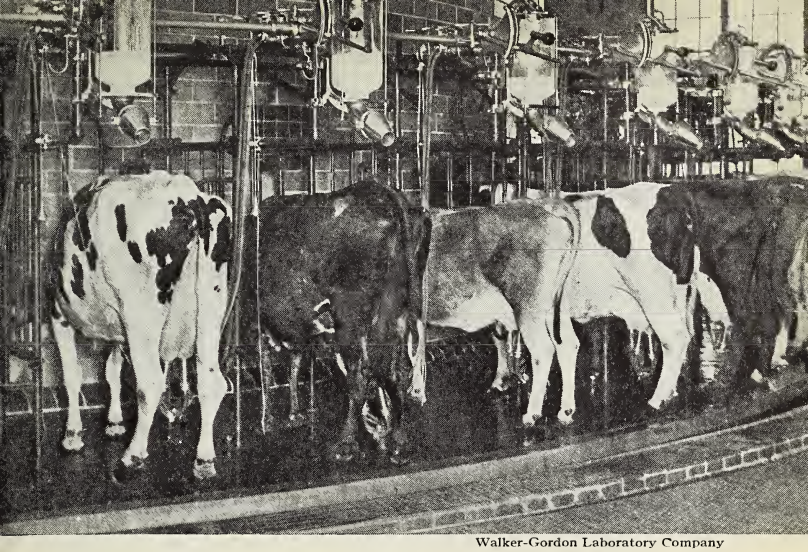
MILK SUPPLY

In the early days of mankind milk was used as an article of diet only by tribes that had large herds of domesticated animals. But in the course of time milk came to be prized as a delicious drink for everyone and as almost essential for the raising of babies. In the latter part of the nineteenth century and the early part of the twentieth, milk was given its rightful place as the most important of all foods. It was then that scientists discovered that milk contains most of the food materials necessary for growth and health protection. Unfortunately, however, milk also comes first among all the foods that are likely to spread disease. Milk is almost an ideal place for the growth of bacteria, since it supplies bacteria with the three principal things they need—food, warmth, and moisture.

As milk is our most important food, the guarding of its purity is of fundamental importance. The contamination, or infection, of the milk supply of a community with the germs of a communicable disease is a menace to the lives of all the citizens. Clean milk is one of the best foods in the world and unclean milk is one of the worst.

In the days when people first came to America to live most of the settlers had cows which they kept for their own use. They seldom sold their milk and, if they did, it was sold to only a few people. Today dairy farming is a vast industry. Milk furnishes one fourth of the total farm income of the United States. Three million farmers sell it. The country uses one hundred billion pounds a year—40 per cent as milk and cream and 60 per cent as butter, cheese, canned milk, powdered milk, ice cream, and in many other ways.

Most communities get their milk from one or more dairy farms. Comparatively few individuals, even in the country,



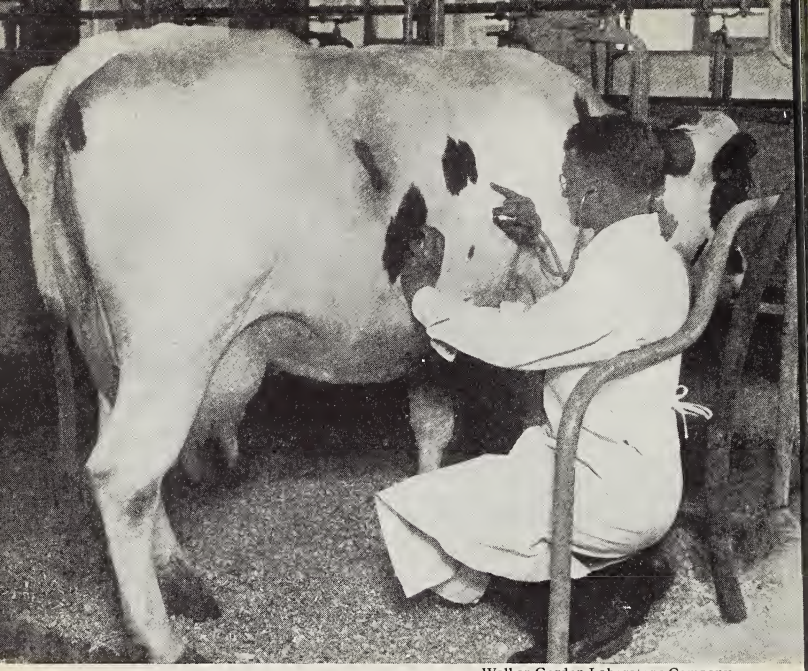
Walker-Gordon Laboratory Company

Spotlessly clean cows being milked
by milking machines sterilized beforehand

keep their own cows. As a result one sick cow in a dairy herd or one sick milker employed on a dairy farm may be the means of polluting the milk supply of a whole town or city.

This fact is illustrated in the case of an outbreak of septic sore throat in Lee, Massachusetts, in the year 1928. At that time the town of Lee had a population of 4000, and its health record was excellent. But suddenly many people became violently ill of septic sore throat, and some died. An investigation of the milk supply of the town revealed that a milker in one of the dairy farms had septic sore throat.

Experiences of this kind have led to the strict control by public-health authorities of the production and handling of milk. Health departments usually require the licensing of all milk producers. State health or dairy officials and



Walker-Gordon Laboratory Company

Giving a cow a health examination.
What instrument is the doctor using?

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local health departments send inspectors at regular intervals to places where milk is produced or handled. These inspectors observe the health and cleanliness of the cattle, the cleanliness, light, and ventilation of the barns, the health of the milkers and the methods of milking, the cleaning and sterilizing of milk pails and other utensils, and the methods of keeping the milk cold. Visits of inspection are made to milk-receiving stations in the country and to distributing stations in the city. The dairy industry and health authorities working together have helped to make the milk produced on our dairy farms the purest milk in the world.

The disease of cows which is most commonly transferred to man through milk is bovine tuberculosis. This kind of tuberculosis affects the bones and glands of children. Cattle infected with this disease may be detected by a skin test called the tuberculin test. Herds which have been tested and found free of infection are known as accredited herds.

On many dairy farms the health of the cows is carefully watched. Physical examinations, including blood tests, are made from time to time. If any cow is found not to be in the best of health, she is kept away from all other cows and her milk is not used until a veterinarian, or animal doctor, says she is entirely well. Keeping constant watch over the health of a dairy herd frequently leads to the detection of other diseases of cows besides bovine tuberculosis. The udders of the cows receive careful inspection because an infected udder may lead to the entrance of bacteria and pus into the milk.

Milk may be infected with disease germs if the men who milk the cows have any sort of communicable disease. A milker may be coming down with typhoid fever or septic sore throat, or some other disease the germs of which may contaminate milk, without appearing to be actually ill. Moreover, there are some people who have in their bodies the germs of typhoid fever or of other diseases without having any symptoms of disease. Such people are called carriers. There are numerous cases of carriers who have infected a milk supply.

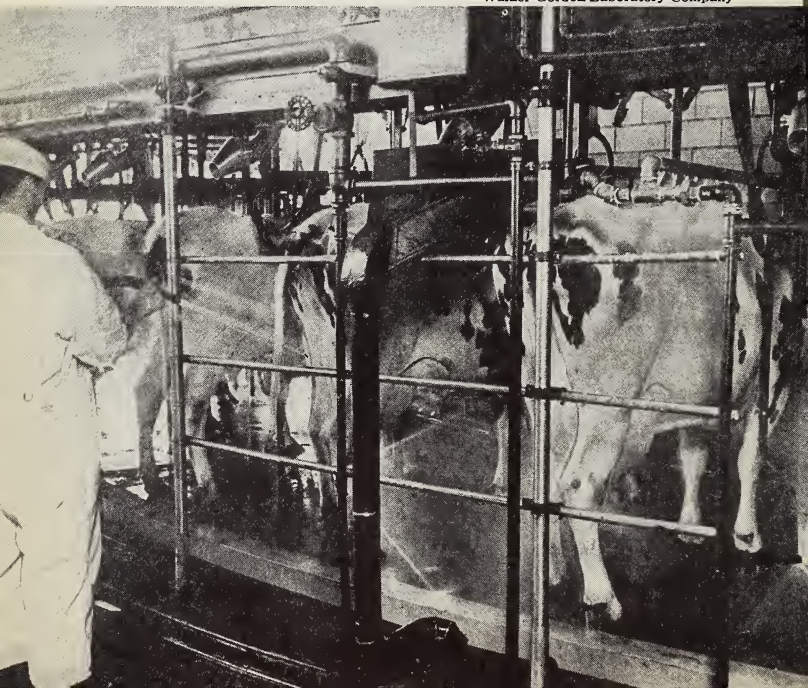
To prevent the contamination of milk by milkers who may be infected with disease germs, the health authorities of many communities require the frequent medical inspection of all milk-handlers. The milkers are also trained in habits of cleanliness. Before milking the cows they must

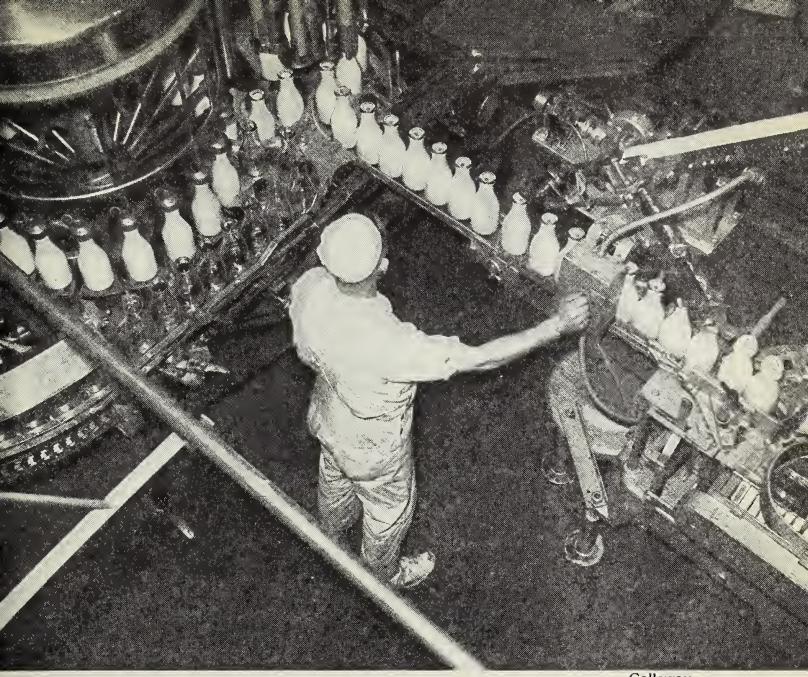
wash their hands thoroughly with soap and water and then with a disinfectant. They must put on clean white suits and caps. The udders of the cows are washed before each milking, and the milk pails are sterilized.

Milk is warm when it comes from the cow. Cooling it helps to prevent the growth of bacteria that cause souring or spoiling. On most dairy farms milk warm from the cow is carried immediately to a milkhouse, where it is strained and poured through a cooler into big cans which have been sterilized. The cans of cool milk are then placed in a refrigerator room where they are kept at a temperature of 50 degrees Fahrenheit, or less, until they are taken to the country milk stations. The growth of bacteria in milk is stopped at

Giving the cows' udders a shower bath just before milking time

Walker-Gordon Laboratory Company





Galloway

Bottling milk by machinery.
What is the first consideration in a modern milk-bottling plant?

"

a temperature of 50 degrees Fahrenheit. If the temperature is allowed to go higher the milk will soon become sour.

From the country milk stations milk is taken into a city in tank trucks or in express milk trains. The stainless-steel tank cars which make up a milk train are lined with glass and are so well insulated that the milk does not change its temperature by a degree during a long journey. When the milk reaches the city receiving station it is pumped out of the tank cars through stainless-steel equipment and is then pasteurized and bottled.

In a modern bottling plant machines take complete

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charge of the bottles. These machines clean the bottles, sterilize them, fill them with pasteurized milk, and cap them tightly, all without aid of human hands. Cleanliness is the first consideration. Twice a day every pipe and vessel which the milk touches is taken apart, scrubbed, sterilized, and then put together again.

The Pasteurization of Milk

In spite of the utmost precautions taken to handle milk in a cleanly manner there is always a chance of failure in the chain of defense against infection. Fortunately we have the added defense of pasteurization, which is done just

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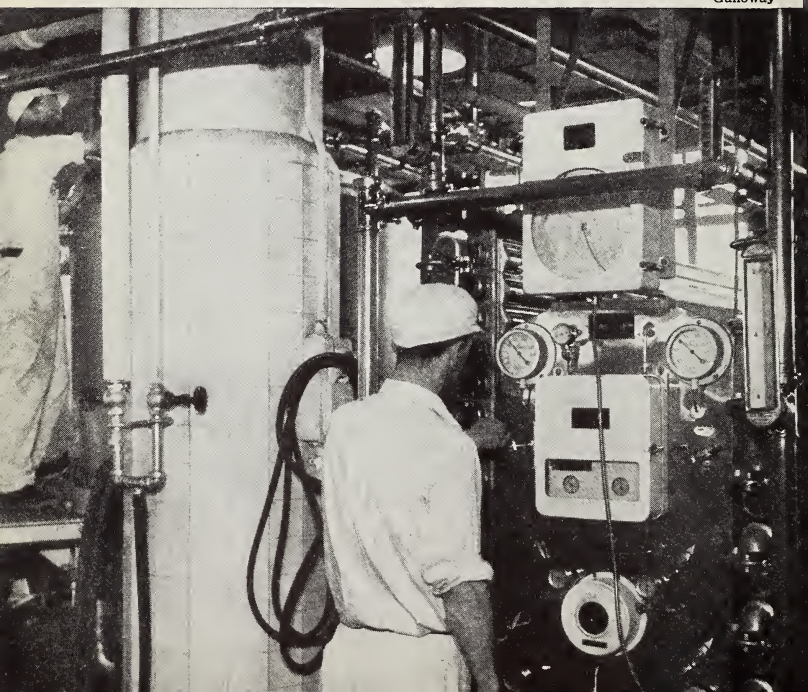
In pasteurizing milk the temperature must be carefully regulated

Galloway



before the milk is bottled. Pasteurization consists in heating milk to a degree high enough to destroy disease germs and other bacteria that might cause milk to sour or spoil quickly. The process ordinarily used is to heat the milk to a temperature of from 142 degrees to 145 degrees Fahrenheit and to hold it at this temperature for at least half an hour. It is then promptly cooled to a temperature of 50 degrees or lower.

On farms and other places where pasteurized milk cannot be purchased, home pasteurization may be carried out by placing the milk in the top part of a double boiler and heating it by boiling water in the bottom part of the boiler until a dairy thermometer placed in the milk registers 155 degrees Fahrenheit. The milk must then be removed from the stove and cooled as rapidly as possible by placing cold water in the bottom part of the double boiler and changing the water repeatedly until the milk is chilled.

When properly done, pasteurization does not change the taste of milk or take away any of its food value except for the destruction of part of its vitamin-C content. This is unimportant because supplies of this vitamin may readily be obtained from citrus fruits and many other raw fruits, from tomatoes (either fresh or canned), and from raw vegetables. Babies fed on pasteurized milk should always be given orange juice or tomato juice to make up for the lack of vitamin C in the milk.

The pasteurization of milk has played an important part in the reduction of deaths from communicable disease, especially among infants. The pasteurization of milk became widespread in 1907. A person now forty years old may very possibly owe his life to a safe supply of milk in childhood. Fifty years ago one out of every five babies died in its first year of life. Infant diarrhea took the lives of thousands of babies every summer. This disease is often spread by in-

fected milk. Today deaths from the intestinal diseases of infancy have been greatly reduced. Now out of every twenty babies born, only one dies in the first year of life. One of the chief reasons for this great saving of life among babies is the purity of modern milk supplies.

Laboratory Testing of Milk

As part of the program of community milk hygiene, state or community health inspectors collect samples of milk from time to time from dairy farms and from stores and delivery wagons. These samples are tested in the laboratory in order to find out how many bacteria per cubic centimeter (one fourth of a teaspoonful) of milk each sample contains and also to find out how rich it is in butter fat. In most cities pasteurized milk is graded A or B, according to the number of bacteria it contains. The following grading is used in most cities: Grade A, not over 10,000 bacteria per cubic centimeter; Grade B, not over 50,000 bacteria per cubic centimeter when delivered.

In addition to these grades, there is a high grade of raw milk called certified milk. The right to label a milk as certified is given to a dealer by a milk commission appointed by the local medical society or by some official body. Certified milk comes from healthy cows, is handled by milkers who have frequent medical examinations, is produced under specially clean conditions, reaches a high standard of butter-fat content, and contains less than 10,000 bacteria per cubic centimeter. Certified milk usually is purchased for feeding infants.

ARE YOU DOING YOUR BEST TO HELP IN THE PROVIDING OF PURE WATER AND MILK FOR YOURSELF AND OTHER PEOPLE?

Are you careful not to pollute any body of water used for drinking purposes?

Do you drink only water that you know is pure?

If you are not certain of the purity of any water you wish to drink, do you boil the water before drinking it?

Are you careful not to touch the bubbler with your lips when you drink water from a bubble fountain?

Do you drink only pasteurized milk?

Do you know how to pasteurize milk in case you live in a place or are going to a place where pasteurized milk is not available?

Do you drink water and milk only from cups or glasses that have been thoroughly washed in soap and hot water and scalded with boiling water after they were last used?

Do you help to keep the milk used in your home clean, cold, and covered?

THINK ABOUT THESE QUESTIONS

1. Why is a supply of pure drinking water the principal need of every community? What are some of the ways in which water is used in the body? What percentage of the body is composed of water?

2. What are some of the ways in which water may be made unfit for drinking? Can you tell by looking at it whether water is free of harmful germs? How do you know that the water you drink is safe to drink?

3. Why should a community take every precaution to insure the purity of its milk supply? Why is milk called our most valuable food? Why is it so easy for it to become a dangerous food?

4. How can you tell that the milk served in your home is free of disease germs? Under what circumstances would it be safer to use evaporated or dried milk?

5. What is one of the principal reasons for the fact that life is safer for babies born in 1939 than it was for babies born in 1900?

TRY THESE TESTS

1. In each of the following sentences a word is incorrectly used. Reword each sentence to make it correct by substituting for the incorrect word a word used incorrectly in one of the other sentences. (*Do not write in the book.*)

a. Ancient Rome was supplied with water brought in to the city by magnificent reservoirs.

b. Many citizens of Plymouth, Pennsylvania, died of typhoid fever in 1885 because their water supply was pure.

c. New York City gets most of its water from aqueducts in the Catskill Mountains.

d. Pasteurization is one of the three ways in which water is purified.

e. Water is said to be polluted when it is free of harmful germs.

f. Filtration of water by spraying it into the air is a good way to remove bad odors.

g. The aeration of milk has played an important part in reducing the death rate among infants.

2. Which of the following terms or names do you associate with the subject of water supplies? Which with the subject of milk supplies? Tell what you think of in connection with each term or name.

accredited herds
bovine tuberculosis
chlorinator
John Snow
Lee, Massachusetts
Plymouth, Pennsylvania
infant diarrhea
purification of water by storage
Louis Pasteur

DO THESE THINGS

1. Make a survey of your community water supply. What is the source of the supply? What measures are taken to make the water fit for drinking? If possible, the class may visit the community water-supply system and observe the methods used for protecting and purifying the water. If the school is in a community that has no public water-supply system, each member of the class may describe the water supply of his or her home and what measures are taken to keep the drinking water pure.

2. Find out from histories, encyclopedias, and other reference books about the water supplies of various peoples living in earlier periods of history or in other countries today. The class may be divided into sections, and each section may report on one country or group of people in ancient, medieval, or modern times.

3. Find out more about Robert Koch. In what ways have his discoveries helped us to protect our water and milk supplies?

4. Draw a diagram showing everything that happens to milk from the cow to the consumer. Show on the diagram how at each point the milk may be contaminated with disease germs and how at each point contamination may be prevented.

5. Plan and conduct an experiment to show that warm raw milk sours more quickly than does pasteurized milk kept at a temperature of 50 degrees Fahrenheit or below. Find out what causes the souring of milk. Explain why pasteurization and refrigeration retard it. Explain why pasteurization prevents the growth of harmful bacteria in milk.

6. The following table gives the death rates for typhoid fever and paratyphoid fever (a disease resembling typhoid) in the United States and Canada for each year, beginning with 1900, for which records are available. Make a graph showing the decline in the death rate for these two diseases during the twentieth century in either the United States or Canada. Give the reasons for this decline.

Typhoid and Paratyphoid Fever Death Rates in the United States and Canada

Year	Deaths per 100,000 Persons		Year	Deaths per 100,000 Persons	
	United States[1]	Canada[2]		United States[1]	Canada[2]
1900	35.8	....	1927	5.5	11.6
1905	27.9	....	1928	4.9	4.8
1910	23.5	....	1929	4.2	4.7
1915	12.8	....	1930	4.8	4.4
1920	7.9	....	1931	4.5	4.1
1921	9.0	10.1	1932	3.7	3.2
1922	7.4	8.4	1933	3.6	2.7
1923	6.8	9.0	1934	3.3	2.7
1924	6.7	6.6	1935	2.8	2.5
1925	8.0	5.9	1936	2.5	2.3
1926	6.5	4.9			

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

water-supply system
pollute
intestinal disease
reservoir
purification of water by storage, by filtration, by disinfection
chlorine
chlorinator
aeration
contaminate
contamination
cholera
dysentery
septic sore throat
carrier (of disease germs)
bovine tuberculosis
tuberculin test
accredited herd
cubic centimeter
Grade A milk
Grade B milk
certified milk

[1] United States Bureau of the Census.

[2] Dominion Bureau of Statistics.

2. Complete each one of the following incomplete sentences with a word, or words, or term from the list above:

a. Typhoid fever is a good example of __?__ __?__.

b. A disease of cows which may be transferred to man through milk is __?__ __?__.

c. Bacteria from the body of a __?__ may __?__ or __?__ milk.

d. The health department of Millville recently purchased a __?__ to be used in disinfecting the water in the town __?__.

3. Tell the difference between each of the following words or terms:

Grade A milk, Grade B milk, and certified milk
filtration, disinfection, and aeration
chlorine and cholera
dysentery and septic sore throat

UNIT III

The Care and Preparation of Food

Next to drinking water, our greatest need is food. Primitive people took the gifts of food that the earth had to offer. They did not know how to win more from the earth than the earth gave freely. No one knows how long it took for people to learn that they might plant grain and fruit trees and vegetables instead of going out to look for plant foods here and there on the hills and plains. No one knows how people found out that they might tame cows and horses and sheep and pigs and keep them in pens in their own back yards or send them out to browse on the hills and plains under the care of a shepherd. But we do know that a great change took place in man's way of living when it was found that animals and plants might be tamed. This knowledge was one of the most important factors in the development of settled home and community life.

> For the grain it stands fast where it starts in to grow
> And the men who would reap it must stay where they sow.

Many hundreds of years after the domestication of plants and animals had made it possible for people to control their food supplies, it was discovered that solid food, as well as water and milk, might under certain conditions cause illness or even death. The purity of the family food supply is another one of the important concerns of every home in a community.

DO YOU KNOW

How the government protects its citizens against chemical poisons in food?

What is meant by an adulterant?

What botulism is?

How health departments protect citizens from the dangers of unclean food?

The part played by refrigeration in preserving food?

Why handwashing before eating or preparing food is a good health habit?

What is meant by food fads?

What allergy is?

How cooking helps to make foods safe?

Keystone

Farmers washing apples before sending them to market

PROTECTING FOOD OUTSIDE THE HOME

To a large extent our food supplies are guarded by government regulations so as to protect us against the presence of chemical poisons. Since farmers are obliged to spray fruit trees and vegetables with poisonous chemicals in order to kill insects and parasites that might otherwise damage their crops, regulations have been made which require the farmers to wash fruits and vegetables before sending them to market. However, as we occasionally hear of cases of poisoning caused by chemicals such as the lead or arsenic used in sprays, it is important to wash thoroughly all fruits and vegetables, whether they are to be cooked or to be eaten raw.

Another possible source of chemical poisoning is the use of adulterants in preparing foods for sale. An adulterant is something added to a food to preserve it, to make it more attractive to the eye, or to substitute a cheap ingredient for a more expensive one. Laws known as food and drugs acts protect citizens of the United States and Canada from food and drugs which are adulterated with harmful substances or which are misbranded. Misbranding means the use of an untruthful or misleading label. If it is suspected that the label on a package or bottle does not tell the truth about the contents, government inspectors obtain samples of the product and have them analyzed in a laboratory. If it is proved that the manufacturer has violated the law, the product can no longer be offered for sale and the violators may be punished.

Some harmless adulterants are permitted by law, but their presence in a food must be noted on the label. The use of chemicals such as benzoic acid and benzoates for preserving foods and of certain substances for coloring butter and candies is permitted. Other substances known to be dangerous, such as formaldehyde for preserving milk and copper salts for making vegetables look green, are prohibited. Look over packaged and bottled foods on the shelves of your kitchen cabinet and note how they are labeled.

One reason for reading the labels on packaged foods is to find out how much they weigh. When you buy meat and fresh fruits and vegetables and

Government inspectors taking a sample from a shipment of frozen egg yolk in order to have it analyzed

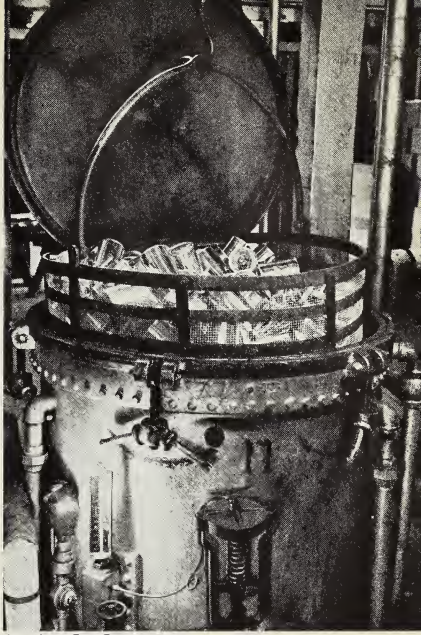
other foods that are not put up in packages, the storekeeper weighs out on his scale the amount you wish to buy. On the scale you may see a seal or stamp that has been put there by a government inspector who has tested the scale and found that it gives correct weight. When you buy food in cans and bottles and boxes you will see printed on the label the net weight of the food inside. It is a good idea always to look for the net weight before buying a certain brand of canned, bottled, or packaged food for the first time. Then you know just how much food, and not how much bottle or box or can, you are getting for your money.

Protection against Toxin-Forming Bacteria

Food may be made unsafe to eat by the toxins, or poisons, formed by certain bacteria, as well as by chemical poisons. A germ sometimes develops in canned or preserved foods which have been imperfectly heated and produces a deadly toxin causing the disease known as botulism. No one knows just how this germ gets into food. Practically, it would be impossible to examine all food before canning in order to find out whether or not the germ is present. But if, during the canning process, the food is properly sterilized by heat and the cans perfectly sealed, it will be impossible for the germs to develop and produce poison.

Failure to sterilize preserved food completely may not be known for weeks or even months after canning. Since the appearance several years ago of cases of botulism caused by eating commercial canned food, additional precautions have been taken by the packers to ensure the complete sterilization of canned goods. Botulism from this source has been almost done away with.

In order to avoid the risk of botulism and other forms of food poisoning caused by toxin-producing germs, never use



Cans of peas ready to be sterilized by heat. Why is the complete sterilization of canned goods necessary?

American Can Company

any food which appears to be spoiled. No food should even be tasted if it has the slightest unnatural odor or color. In nearly every case of botulism it was reported that the food responsible for the poisoning had an offensive or an unnatural odor. Never use food from cans which bulge at the ends. The swelling of the can indicates the presence of gases which may have been produced by toxin-forming germs.

The early symptoms of botulism are a feeling of fatigue with headache, dizziness, and muscular pains or weakness. In many cases the patient notices that he cannot see well. There is an antitoxin which doctors use for the treatment of botulism. It is of value only if the condition is recognized early and the treatment started promptly.

Protection against Infection

A more common cause of food contamination is the presence of disease germs or parasites which infect the person who eats the food and produce a particular disease. There are three ways in which the food may be contaminated. First, meat from a diseased animal may contain parasites, such as the parasite trichina, which causes a disease called

trichinosis. Second, the intestinal discharges of rats and mice may infect food with the germs of certain intestinal diseases. Third, foods may be contaminated with germs from the bodies of human beings. Epidemics of typhoid fever and dysentery have been traced to the handling of foods by human carriers of the germs of these diseases. Oysters and other shellfish bred in waters into which sewage empties may be infected with the germs of typhoid fever. Food also may be contaminated by flies which have crawled over human discharges containing disease germs.

To protect the public from the danger of eating meat from diseased animals, the inspection of meat offered for sale is required by law. In the United States all cattle, sheep, and swine used in interstate commerce (that is, shipped from one state into another) must be inspected before and after slaughter by agents of the United States Department of Agriculture. The carcasses of animals that are found free of disease are stamped with a government seal. To ensure the purity of animal food sold in Canada the inspection of cattle, meat, and dairy products is controlled by the Dominion Department of Agriculture.

To protect the public from food contaminated through unsafe handling, the health department in most cities and large towns employs inspectors to supervise places where food is sold. Severe penalties may be imposed on merchants who do not observe sanitary precautions. Foods that will not be cooked after purchase, such as cheese, tub butter, and bakery goods, must be kept in glass cases away from flies, rats, mice, dust, and handling by the customers. Fruits and vegetables must be protected in the same way as far as possible. Meat and fish must be stored in refrigerators and displayed only on ice.

In many communities each meat market, grocery, delicatessen store, bakery, candy store, soda fountain, fruit

stand, restaurant, and hotel is inspected regularly and must have a health-department permit in order to operate. In some communities a score card is filled out giving the sanitary standing of the establishment. This card must be posted in a place where everyone can see it. Do you live in a community that has a health-department ruling of this kind? It is one of the finest things that can be done to protect the health of the citizens, as the enforcement of regulations governing the sanitary handling of food is one of the chief ways in which the spread of communicable disease may be controlled. If there is no health-department supervision of food stores in a community, the customers must assume the duties of inspectors and refuse to patronize stores in which the food is not protected from flies, vermin, dirt, and unnecessary handling.

THE CARE AND PREPARATION OF FOOD IN THE HOME

As soon as food arrives in the home, the perishable foods should at once be stored in a refrigerator or icebox. This helps to keep perishable foods fresh and retards the growth of bacteria that might otherwise cause the foods to spoil. Probably men learned very early that keeping certain foods cold would make them last longer in good condition. In an exhibit at the world's fair in Chicago in 1933–1934 showing the various steps in the development of food preservation, there was one scene picturing how primitive peoples may have discovered the value of keeping foods cold. An old cave woman discovers after a hunt for fresh food has failed that meat left by chance in a cold place far back in the cave "is good." "The meat is good because it was kept cold," she reasons. "We will always keep meat where it is cold."

Coons

How is this girl helping her mother to keep perishable foods in good condition?

Milk, meat, fruits, vegetables, eggs, butter, cheese, and such cooked food as is left over should be kept in a refrigerator or icebox at a temperature of 50 degrees Fahrenheit or less. The refrigerator never should be overcrowded; if it is, the cooled air will not have a chance to circulate freely and evenly around the various foodstuffs. Foods should be unwrapped and placed in clean covered containers before they are put in the refrigerator.

The refrigerator should be cleaned thoroughly once a week. Before doing this the current should be turned off if the refrigerator is run by electricity, or the ice removed if the refrigerator is kept cold with ice. Use lukewarm water and soap to clean the refrigerator, as hot water raises the temperature. Gratings or shelves should be taken out and washed in hot suds. If ice is used in the refrigerator, the ice chamber should be washed out before the ice is put in again, and the drain pipe should be cleaned regularly.

Foods that are not kept in the refrigerator should be stored neatly in places that are cleaned often. It is especially important to protect from insects, rats, and other vermin all such foods that are not cooked after their arrival in the home. Examples of foods of this kind are bread, cookies, cakes, crackers, ready-to-eat cereals, and cheese.

Cooking

It has been said that "man is the only cooking animal." When and how he first learned to use heat in making his food more appetizing and more digestible is a secret of the past. However, we have evidence that man was already cooking animal food fifteen thousand years ago. In the south of France scientific explorers have found immense heaps of bones left by the people of the Old Stone Age. The bones have all been split lengthwise, showing that early man liked the tasty marrow to be found inside. These split bones are mingled with layers of charcoal and stones bearing the marks of fire. We know that prehistoric people also baked bread, because gritty burned cakes of coarsely ground grain have been found in the ruins of dwellings built during the Stone Age in Switzerland.

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A prehistoric family enjoying a feast of cooked meat

Wide World

A pancake-making contest.
These boys are proving that cooking is an art

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The history of invention shows that the discovery of one very simple principle often leads to a thousand and one different ways of using it. So it was with the discovery that heating food makes it more tasty. Cooking became an art, with cooks as the artists, and in every age of history we hear the praises of good cooks and good cooking sung. This is as it should be, because appetizing food not only adds to the enjoyment of life but aids digestion, by stimulating the flow of the digestive juices.

Cooking also helps to make foods safe, because heat when applied for a sufficiently long time kills all the germs of the ordinary communicable diseases. Cooked food coming from the kettle usually is biologically clean; that is, it is free from harmful germs.

Cooking also destroys certain parasites, such as the hookworm, tapeworm, and trichina, which may be found in the meat from diseased animals. Although great precautions are taken by the government in the inspection of meat, it sometimes happens that meat from an infected animal may come on the market or it may be consumed on the farm where the animal was raised. Some deaths occur each year from the disease trichinosis, which is caused by the trichina parasite, or flesh worm. This parasite is found usually in infected pork or in food prepared from infected pork, such as sausages. The parasites are destroyed when the pork is cooked *thoroughly*. Merely frying pork over a flame for a few minutes does not make it safe. Frequently a fried or broiled pork chop, while cooked on the outside, remains almost raw on the inside. In that state not only is the meat indigestible but also there is danger of getting trichinosis. Pork is just as nutritious as other meat, but it must be *thoroughly cooked.*

The four principal ways of cooking food are boiling or steaming, baking or roasting, broiling, and frying. Of these, frying is the least desirable because fried foods usually are soaked in fat. Neither saliva in the mouth nor gastric juice in the stomach can act on fat. Therefore foods covered with fat cannot be digested until they

Armstrong Roberts

"

How may you help to keep germs from "catching a ride" into your body on foods that you carry to your mouth with your fingers?

reach the small intestine. This means that part of the starch in fried carbohydrate foods, such as fried potatoes and doughnuts, and part of the protein in fried meats and eggs may escape digestion.

In boiling vegetables, contact with the oxygen of the air destroys part of the vitamin-C content. For this reason vegetables should be boiled in covered vessels and for as short a time as possible. As mineral salts present in vegetables dissolve in the cooking water, this water should be saved and used in sauces and soups.

Handling Food in the Home

Strict cleanliness in preparing, serving, and eating food is a great help in the control of communicable diseases. The protection given by the government regulation of foods offered for sale and by the refrigeration and cooking of food in the home may go for nothing if food ready to serve is sneezed on or eaten from unclean dishes and silverware or handled with dirty fingers.

Do you sometimes help to prepare the meals at home? Are you ever asked to slice the bread or pour the water and milk or to put the butter or jelly or cake on the table? Before starting to prepare food or to set the table always wash your hands first with soap and water. Before pouring milk from the bottle wash the top of the bottle and wipe it with a clean cloth. Be careful not to touch the rims of glasses with your fingers when you pour milk or water. Never cough or sneeze on food. If you should drop a slice of bread or a piece of cake on the floor, pick it up and throw it into a garbage can. Even if there were no living germs on the floor, it is not pleasant to eat food soiled with the dirt from people's shoes. Protect food from flies and dust by keeping it covered until it is ready to serve.

In making lemonade or whipped cream or eggnog or salad dressing or any other cold food or drink that needs to be sweetened or seasoned, people sometimes dip up little bits on a spoon to taste it. Have you ever seen anyone put the spoon back into the bowl or pitcher after taking a taste? Have you ever done it yourself? Sometimes in feeding a baby the person feeding him will taste the food with the same spoon with which the baby is being fed. Sometimes boys and girls swap bites of apples or candy or other food. Sometimes they use a cup or glass that someone else has just used.

Direct from mouth to mouth is one of the shortest roads over which harmful germs may pass from one person to another. In order to close this road this is the law you must enforce: Never put into your mouth anything that has touched another person's mouth except eating utensils which have been washed after use in hot soapsuds and rinsed with boiling water. Of course this rule works both ways. You must be careful also to protect other people from unclean food or eating utensils.

The next time you eat a meal, notice how many times you carry food to your mouth with your fingers. How many things do you touch with your hands in the course of a day? One scientist kept track of everything he touched for a certain length of time. He found that his hands had come in contact with ninety-two different things. Count all the things you touch with your hands during the hour before you eat your lunch. How many of the things you touch are touched by other people? Think of doorknobs, books, chalk, desk tops, pieces of money. How many other things can you think of?

Scientists are not sure how much danger there is in touching objects that other people have touched with unclean hands. Fortunately most germs are killed by drying and

by a temperature which is either too hot or too cold. But you may touch many things which have been touched a very short time before by a person who has living germs on his hands. If you use your hands to carry food to your mouth shortly afterward without first washing your hands, you may carry germs into your mouth.

FOOD FADS

You may have read advertisements or magazine articles or heard conversations in which it was stated that certain combinations of food are dangerous to health. People who believe this are called food faddists, and the various systems of diet they have worked out are called food fads.

Some people think that meat is harmful when eaten with bread or potatoes. It is a common belief that milk and fruits supposed to be acid should not be eaten together, and that dire things will happen to the rash person who combines milk or ice cream with lobster or some other sea food.

There is no scientific basis for the belief that certain combinations of foods are harmful in themselves. Nearly all foods contain a mixture of the three principal food substances—carbohydrate, protein, and fat. We call certain foods, such as bread and potatoes, carbohydrate foods, simply because they are composed largely of starch. We call other foods, such as meat and cheese, protein foods because they are exceptionally good sources of protein. Milk is called an "all-round" food because it contains nearly all the food materials essential for growth and health in nearly ideal proportions.

The notion that milk and fruit eaten together is harmful is probably based on the fact that acid curdles milk. But milk must be curdled in the stomach before it can be di-

gested. This is done normally by the acid in gastric juice. Moreover, most fruits, with a few exceptions (cranberries, plums, and prunes) form alkalies rather than acids when they are burned by the body cells.

A diet made up of many different kinds of foods is found by most people to be favorable to health. There are people, of course, who need a special diet, but this diet should be prescribed by a physician. It is never safe for people who are overweight or underweight or who have frequent digestive upsets or some other body disturbance to experiment with food combinations recommended by well-meaning friends or food faddists. The diet may be lacking in some essential food material, or dependence on it may mean the neglect of some serious condition which should have immediate medical attention.

FOOD ALLERGY

Although there is no foundation for believing that certain combinations of food are in themselves harmful, it is true that for some people certain foods seem to act as poisons. For example, a person may have a skin rash every time he eats strawberries. Such a person is said to be sensitive to strawberries. Food allergy is the scientific name given to the disturbances which arise when a person is sensitive to a certain food or foods. Food allergy may announce itself in any of the following forms: hives or skin rashes; a skin eruption called eczema; a kind of difficult breathing called asthma; frequent sneezing and a stuffed-up feeling in the head; severe one-sided headache called migraine; violent digestive upsets accompanied by vomiting and diarrhea.

True allergy is always caused by sensitiveness to some particular protein substance in food. The foods that most

often produce the symptoms of allergy are strawberries, tomatoes, fish and shellfish, chocolate, cereals (especially wheat), pork, eggs, milk, and milk products, such as cream, butter, and cheese.

Most of the symptoms caused by food allergy may, however, be owing to other causes. Asthma and hay fever, particularly, may be caused by sensitiveness to the pollens of various weeds and grasses, to dusts, and to feathers and animal hair. If the history of a person suffering from some form of allergy leads a physician to believe that it may be owing to a particular food, skin tests usually are made to find the offending protein substance. Suspected proteins are rubbed into the skin through small scratches or are in-

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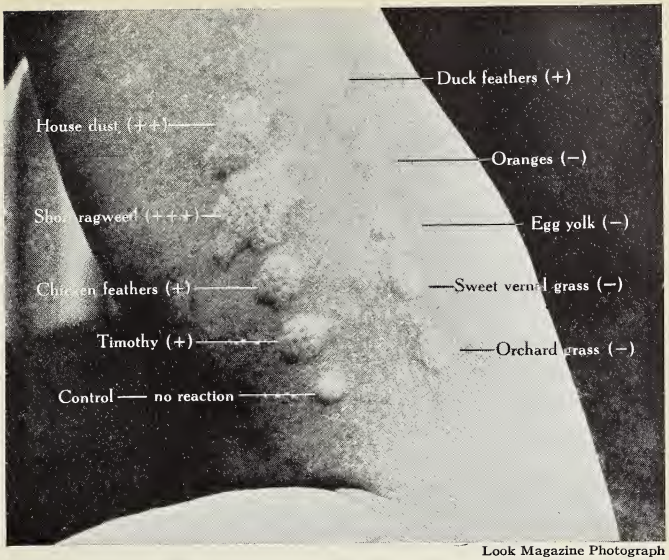
"Please take good care of him.
The doctor says that I must give him away
because I am sensitive to cat hair."

Look Magazine Photograph



Look Magazine Photograph

The result of a skin test for sensitiveness to various substances. The number of plus signs indicates the degree of sensitiveness. A minus sign indicates that the person is not sensitive (no reaction)

jected between the layers of the skin. The appearance of a swelling, or ridge, on the skin with a reddened zone around it is taken as an indication that the person is sensitive to the particular protein rubbed or injected into the skin.

The treatment for food allergy may be either the avoiding of the particular food causing it or the taking of very minute repeated doses of the offending food. The doses are increased gradually over a long period of time until it is possible to take normal amounts without bad effects. The latter treatment usually is tried with young children who are sensitive to foods, such as milk, which are almost essential for proper growth.

ARE YOU DOING YOUR BEST TO SAFEGUARD YOUR OWN FOOD SUPPLY AND THAT OF YOUR FAMILY?

Do you wash thoroughly all fruits and vegetables to be cooked or eaten raw?

Do you read the labels before buying packaged foods?

Do you refrain from eating or serving any canned food that has an offensive or unnatural odor or appearance?

Do you patronize only food stores, soda fountains, and restaurants where the food and the serving and eating utensils are protected from dust, flies, vermin, and unnecessary handling?

Do you store perishable food in a clean refrigerator or icebox?

When you have pork, sausages, or "hot dogs," or "hamburgers" for a meal, do you make sure that they are thoroughly cooked?

Do you avoid fried foods as much as possible?

Do you boil vegetables in covered pots and save the cooking water for soups and sauces?

Do you handle food, dishes, and eating utensils in a cleanly manner and always wash your hands before eating or preparing food?

Do you use the knowledge you have gained about food to examine critically the claims made by food faddists?

Do you ask your parents to take you to a doctor when you believe that any food or combination of food disagrees with you or when you think that you need medicine or a special diet?

TRY THESE TESTS

1. Tell what you associate with each of the following words or terms:

adulterant	refrigeration
misbranding	interstate commerce
botulism	food fad
trichinosis	allergy

2. Which of the following statements are true and which are false? Reword each false statement so as to make it true. (*Do not write in the book.*)

a. Laws enacted to control the purity of food and the sale of drugs protect citizens of the United States and Canada from false or misleading advertising.

b. It is dangerous to use any food which appears to be spoiled.

c. Flies may act as carriers of disease germs.

d. Perishable food should be kept at a temperature of about 60 degrees Fahrenheit.

e. Cooking has no value except to make food more appetizing.

f. Frying is the least desirable method of cooking.

g. It is the act of a good friend to offer another a bite of the apple he is eating.

h. It is foolish to throw away a whole slice of bread that has been dropped on the floor.

i. The belief that certain combinations of food are harmful is unscientific.

j. True food allergy is always caused by some special protein.

THINK ABOUT THESE QUESTIONS

1. Why should laws be made to protect the citizens who buy food in stores and restaurants? What national laws protect the consumers in the United States or Canada? What laws or health-department regulations protect the consumers in your state or province? Against what dangers and frauds do these laws protect?

2. To what extent is the consumer of food protected by law? At what point must the consumer protect himself? In what ways may consumers protect themselves and others from poisoned food and from food containing living disease germs or parasites?

3. What are the advantages of keeping perishable foods cold?

4. What are the advantages of cooking food? What are the four different methods of cooking? Which are best?

5. In view of the tremendous amount of food advertising and of the great number of current food fads and food prejudices, why is it a good idea to have a scientific knowledge of food?

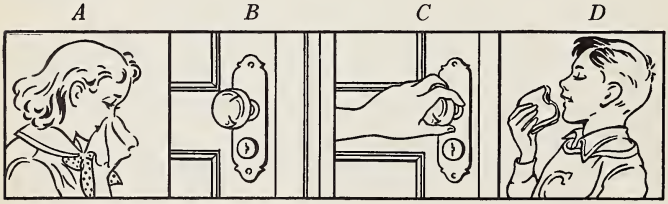
DO THESE THINGS

1. Appoint a committee of the class to visit the local health department and find out what measures are taken to secure the sanitary handling of food in places where food is sold in your community. After the committee has made its report, discuss in class the ways in which each citizen may co-operate with the health department in protecting food offered for sale.

2. Study the spoiling of food and its causes, using a microscope if possible. Find out why keeping perishable food cold helps to prevent rapid spoiling; why pasteurized milk keeps sweet longer than raw milk; and why properly canned food can be preserved almost indefinitely.

3. Draw diagrams to show how the germs of communicable diseases may be passed from person to person by indirect contact; that is, by handling or using something that has been handled or used by someone else.

EXAMPLE:



Person with a cold	Doorknob handled by *A*	Hand of *C* touching *B* after *A* touched it	*C* eating a sandwich with unwashed hands after touching *B*

4. Read "A Dissertation upon Roast Pig," by Charles Lamb, and discuss it in class. Those of you who like to write or tell stories may make up your own versions of the beginnings of cookery. Others in the class may find out what they can about the art of cooking in different historical periods and different lands and report to the class.

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

arsenic	carcass
adulterant	biologically clean
misbranding	food fad
benzoic acid	food allergy
benzoate	eczema
formaldehyde	asthma
botulism	migraine
trichina	sensitive (to something, as food)
trichinosis	indirect contact

2. From the list above select the names of three diseases and tell the difference between the ones you select.

3. From the list above select the word or term described by each of the following groups of words:

not telling the truth on a package label
a poisonous chemical used in fruit or vegetable sprays
the body of a dead animal
free of germs
a disease parasite
an adulterant permitted by law
an adulterant prohibited by law

UNIT IV

Buying Food and Planning and Serving Meals

Sometimes in planning a meal for company you may have heard your mother say, "We cannot have this because Cousin Kate doesn't like it" or "We must surely have that because it is Uncle Tom's favorite food." Individual tastes in food differ largely because people learned in childhood to like the foods they were brought up on.

The taste for foods we like is what is known as appetite. Nothing short of hunger drives us to eat foods for which we have no appetite. On the other hand we may have an appetite for certain foods even when we are not actually hungry. It is seldom that actual hunger drives us into a drugstore for an ice-cream soda or into a candy store to buy a chocolate bar. Appetite makes us crave food we like although hunger may already have been satisfied by a good meal.

Hunger cannot be trained to become a good guide in choosing food because a really hungry person will eat what he can get. He does not pick and choose. It is appetite we must train, if we are to form good food habits.

Food has such a tremendous effect on a person's chances for a long life and good health that it is a great advantage to learn early in life to like all kinds of healthful foods. It is important also to learn how to buy food wisely, how to combine all the essential foods into appetizing, well-balanced meals, and how to behave at table in order to make a meal enjoyable for one's self and others.

DO YOU KNOW

What points to consider in choosing which food stores to patronize?

What we are actually buying when we buy food?

What happens when any one vitamin is lacking in the diet?

Which vitamin is not liberally provided in ordinary foods?

Why there is so much difference in the costs of different foods?

When a food bargain is not a bargain?

How to plan balanced meals for one day?

How to set a table?

How to practice the art of "invisible eating"?

Under what circumstances canned fruits and vegetables may be superior to fresh?

BUYING FOOD

The sciences of chemistry and physiology have together produced the young science of nutrition. We call this science young because up to the twentieth century no particular emphasis was laid on food selection from the standpoint of health. People bought the food they liked and could afford. The market basket might be filled with cornmeal and salt pork and beans or with imported delicacies and rare fruits and choice cuts of meat, according to the amount of money the housewife had to spend. The fact that rich and poor alike might actually be starving their bodies of essential food materials could not be known until the new science

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What attractions does this meat market have for the customer?

Galloway

of nutrition had discovered that not only do we eat to live and grow but also to keep well.

Nowadays we have very definite scientific facts to help us when we set out for the grocery store and the meat market. It is wiser actually to go marketing than to order food over the telephone. We shall be able to make a better selection of fresh fruits and vegetables and cuts of meat than a busy clerk can. We may also learn to know and to compare the prices and weights of different brands of canned and package goods and to look out for bargains.

The first question that arises is: What stores shall we patronize? This is an important question because the care and handling of food in grocery stores and meat markets and the friendly co-operation and honesty of food-sellers may make a great difference in our health and our finances. First of all the store must be clean. We have already learned that protecting food from dust, flies, rats and other vermin, and from unnecessary handling, plays a large part in the control of communicable diseases.

Another consideration in choosing a food store is that of economy. Stores in which purchases are paid for in cash and in which the customer acts as her own delivery boy may have lower operating expenses than a store which gives credit and has a delivery system. For this reason the prices in "cash and carry" stores may be lower. If a homemaker must spend her food money very carefully in order not to waste pennies, it will be necessary for her to compare day-by-day prices in both kinds of stores in order to determine which will give her better value for her money.

The location of the store a homemaker chooses to patronize should also be considered. The pennies saved in patronizing a store at some distance may have to be used to pay transportation costs. Moreover, a store within easy walking distance is a great convenience.

What We Buy When We Buy Food

After we have made our choice of stores, the next problem is how to spend our food money wisely. In the market we shall not find foods classified according to the food elements in which they are rich. This knowledge we must supply. It would be extremely difficult for the grocer actually to arrange his foods according to these classifications, because there are many foods that are good sources of several food elements. But the arrangement of foods according to the food elements in which they are rich is an important thing to have in mind when one goes marketing. All these elements must be included in each day's diet if we and the people we are planning to feed are to be well nourished.

In buying food we are first of all buying heat and energy. The energy value of a food is measured by the number of calories, that is, heat units, that the food contains. Each individual must take in each day a certain number of calories in the form of food in order to meet his energy requirements.

The amount of energy a person needs varies slightly with age, sex, and season and decidedly with size, body build, and degree of activity. For example, a laboring man will need to take in many more calories than a clerk or a stenographer. A boy or girl who engages in active sports after school hours will need more calories than a boy or girl who spends a great deal of time reading or working at a hobby or playing quiet games. In the table on page 88 you may find the energy requirements of the average individual as worked out according to age by Dr. H. C. Sherman.

The other things we buy when we buy food are materials for the building and repair of muscle, bone, and blood and for protecting health and regulating body activities. In the tables on pages 90

"Why will these girls need more energy food for supper than the girls in the picture on page 89

Rittase

Age in Years	Number of Calories Per Pound	Approximate Number of Calories
Under 1	45	900
1–2	45–40	1000–1100
2–5	40–36	1100–1500
6–9	36–32	1600–1900
10–13	34–27	2000–2700
14–17	30–32	2500–3400
18–25	25–18	3400–3800
30	2750 calories for a man of 152 pounds	
40	2500 calories for a man of 154 pounds	
60	2300 calories for a man of 150 pounds	
70	2000 calories for a man of 134 pounds	
80	1750 calories for a man of 139 pounds	

to 93 you will find the names of the principal food elements you need and what they do for you. You will also get some idea of what the shelves of a food store would look like if the storekeeper arranged foods on sale according to the food elements in which they are rich.

Why Some Foods Are More Expensive than Others

Why is there so much difference in the costs of different foods? The first reason has to do with the law of supply and demand. For example, if a very large potato crop is harvested in a certain year, then potatoes will be cheap that year. If the crop is small, then potatoes will be expensive. In January, when strawberries are out of season, they are very expensive, but in June almost everyone can afford them. In the seasons when many hens are taking a vacation from egg-laying, fresh eggs are more expensive than in the seasons when large quantities of eggs are produced. In order to get a variety of healthful foods at low cost, the wise homemaker watches the markets and takes advantage of

the comparatively cheap prices of foods that are plentiful at certain seasons of the year.

Another reason for different prices in foods is cost of production and marketing. It costs more to raise some foods than it does to raise others. It also costs more to get some foods to market than it does others. For example, during the shad-fishing season in the Hudson River valley, a housewife may stand on the banks of the river and call out to a fisherman that she wants a shad. She will have to pay much less for it than would a housewife in New York City, because the city housewife must pay the extra cost of having the shad packed in ice and shipped in to the city.

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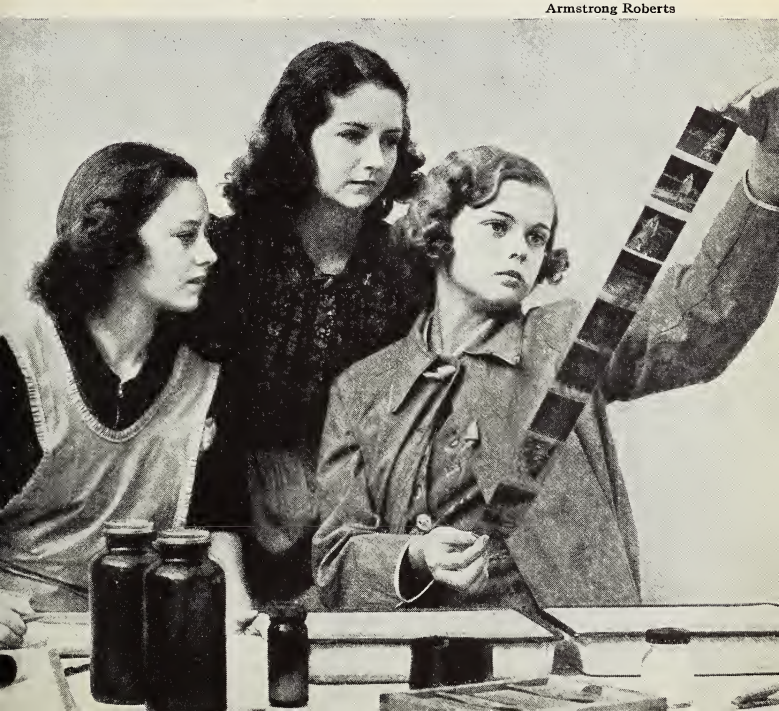
Why are these girls using fewer calories per pound of body weight than the girls in the picture on page 86?

Armstrong Roberts

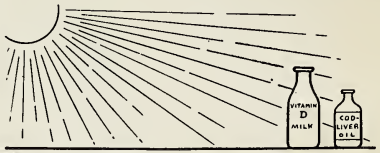


Buying Energy, Building Material, and Body-Regulating Material

Name of Food Element	*What It Does for You*	*Principal Foods in Which You Buy It*
Carbohydrate (sugar and starch)	Both carbohydrate and fat supply heat and the energy needed by the body to carry on all its physical and mental activities	Cereals, bread, potatoes, sugar, molasses, dried fruits, and other sweet foods
Fat		Butter, margarine, bacon and other fat meats, olive oil and other vegetable oils, lard and vegetable shortening, nuts
Protein	It furnishes the body with material for building and repairing the tissues of the body. It also supplies some energy	Milk, cheese, meat, eggs, and fish
Calcium Phosphorus	Calcium phosphate, a combination of calcium and phosphorus, is the principal ingredient of bones and teeth. In babies a lack of one or the other of these minerals results in rickets, a disease in which the bones are soft and poorly formed	Milk, cheese, green vegetables, root vegetables, dried legumes, nuts, and dried fruits, such as figs, prunes, and currants

Iron	It is necessary for building the hemoglobin of red blood corpuscles. A lack of iron in the diet may result in fewer red corpuscles or in corpuscles which do not contain enough hemoglobin or both. This condition is called anemia	Eggs; liver; dried beans and peas; dried fruits; green leaves, such as kale, turnip greens, dandelion greens, and spinach; whole-grain products; and nuts
Iodine	It furnishes the thyroid gland with the iodine necessary for manufacturing a secretion that helps to regulate the speed of body activities. It helps to keep the thyroid gland in a healthy condition. A lack of iodine in the diet may result in a swelling of the thyroid gland called simple goiter	Oysters, clams, lobsters, and other sea food; vegetables raised in soil containing iodine salts. In places far removed from the seacoast iodine may be obtained by using iodized table salt or by drinking water to which iodine has been added by the health department
Cellulose	It furnishes the roughage which is necessary to encourage the normal removal of waste from the large intestine. A lack of cellulose in the diet may result in constipation	The outer coats, or bran, of whole grains, present in whole-grain breads and cereals; the tough skins and fiber of fruits and vegetables

Name of Vitamin	*What It Is*	*What It Does for You*	*Principal Foods in Which You Buy It*
Vitamin A	A clear colorless oil known as pure vitamin A or a yellow coloring matter, carotene, which is found in plants and is changed by the body into vitamin A. It does not dissolve in water but dissolves in liquid fat	It helps to protect you against infections, especially colds. It helps to form tooth enamel. It helps to keep the skin in a healthy condition. It makes it possible for you to see clearly in a dim light. A lack of vitamin A may cause night blindness and a disease of the eyes called xerophthalmia	Butter, milk, green vegetables, yellow root vegetables, eggs, and fruits. Fish-liver oils in liquid or capsule form are very good sources of vitamin A
Vitamin B	A white crystal substance which dissolves in water	It helps to give you a good appetite. It aids digestion and the removal of intestinal wastes. It helps to keep the nervous system in a healthy condition. It helps your body cells to use as fuel the starch and sugar in your daily meals. A lack of vitamin B causes a disease of the nerves called beriberi	Whole-grain cereals, milk, eggs, and most vegetables and fruits. Yeast and wheat germ are the best sources of vitamin B. Nuts are a good source
Vitamin C	A white crystal substance which dissolves in water	It helps to form and to maintain your teeth. It keeps your mouth and gums in a healthy condition. A lack of vitamin C causes a disease called scurvy which is characterized by sore and bleeding gums, loose teeth, pain in the joints and muscles	Citrus fruits (such as oranges and grapefruit), tomatoes, and other raw fruits and raw green vegetables

Vitamin D	A white substance which will not dissolve in water but will dissolve in liquid fat. In the summer your body makes this vitamin when the ultraviolet rays of the sun fall on your bare skin	It makes it possible for the body to use calcium and phosphorus in building bones and teeth. In babies a lack of vitamin D causes rickets	Vitamin-D milk (milk which has been enriched with vitamin D by exposing it to ultraviolet-light rays or by adding concentrated cod-liver oil to it or by giving cows a food rich in vitamin D) and fish-liver oils, such as cod-liver oil or halibut-liver oil in liquid or capsule form. Either vitamin-D milk or fish-liver oil should be taken in the late fall and winter when very few ultraviolet rays reach the earth from the sun 
Vitamin G	A yellow pigment which dissolves in water	It is essential for growth in rats and is probably needed in the diet of human beings. A substance called nicotinic acid closely associated with vitamin G in many foods prevents and cures a disease called pellagra	Whole-grain cereals, fruits, vegetables, dairy products, meats, and fish. Kidney and liver are especially good sources of vitamin G

NOTE. The vitamins described in the table above are not the only ones, but not enough is known about the others to make it possible to answer questions about them

But, even so, the city housewife would find the fish less expensive per pound than beef from cattle that had to be

Twenty cents more or less for vegetables and fruits
Twenty cents or less for meat, fish, and eggs
Twenty cents or more for bread, cereals, and macaroni
Twenty cents or more for milk and cheese
SUGAR
SALT
BUTTER
MILK
Twenty cents or less for butter, margarine, other fats, sugar, and miscellaneous items, such as salt, baking powder, and other groceries

How each dollar that a family has for food should be spent. Why is it a good plan to divide the food money in this way?

cared for and fed on grain and then transported for long distances before and after slaughter.

Perishable foods that must be handled carefully always cost more than foods that do not spoil easily. Grains and foods made from grain, and root vegetables, such as potatoes, onions, carrots, and beets, usually are cheaper than fresh fruits, vegetables, meats, and eggs, that must be kept on ice during transportation to keep them from spoiling.

A large part of the cost of fresh milk is due to the care that must be taken in handling and shipping it in order to keep it pure and sweet until it reaches your home. Evaporated milk and dried milk usually are cheaper pound for pound than fresh milk because the cost of evaporating and canning is actually less than the cost of handling and shipping fresh milk.

The same is true of canned fruits, vegetables, fish, and other foods. Foods usually are canned when they are in season in the locality of the canning factory. Then the packers can obtain the foods in large quantities at low cost. The cost of canning is often less than the cost of keeping perishable foods fresh while on the way to market, and there is no loss to the grocer from spoiling, as is often the case with fresh fruits, vegetables, and other perishable foods.

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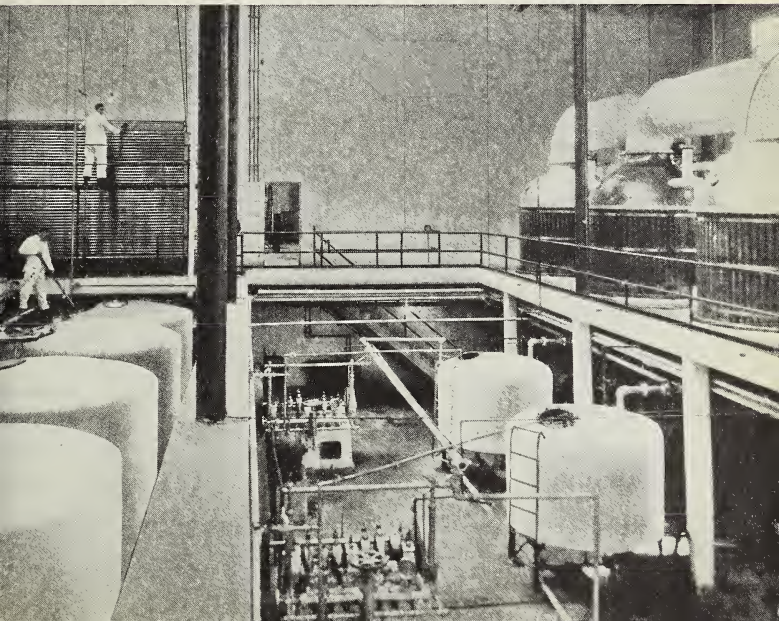
A scene in a factory in which milk is evaporated and canned

The Pfaudler Company



Early in the nineteenth century Napoleon offered a prize of 12,000 francs to the person who could discover a way to preserve food in cans. By offering this prize he hoped to be able to provide his armies with food that could be transported without spoiling. The prize was won by François Appert. Ever since then canning has been used as one of the ways of preserving food.

Modern commercial methods of canning preserve the natural flavor and food value of the fresh product. In this respect commercial canned foods are sometimes better than foods which are canned or cooked at home. Fruits and vegetables, after they are picked, lose part of their vitamin content by contact with the oxygen of the air. Often it

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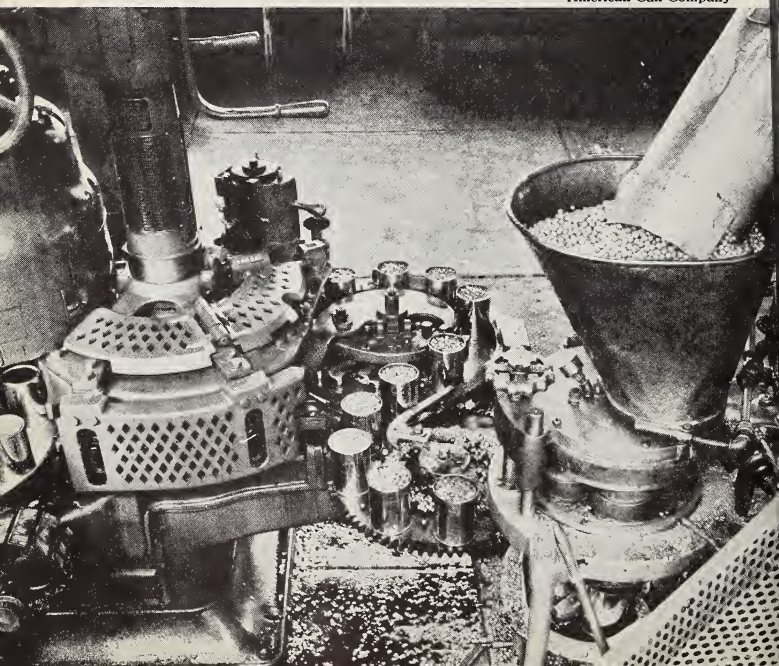
Canning peas in a canning factory.

Why are commercially canned vegetables often better than home-canned vegetables?

American Can Company



takes from one week to ten days for fruits and vegetables to reach our homes from distant parts of the country. Cooking in pots open to the air means that still more of their vitamin content is lost. On the other hand, fruits and vegetables used for canning usually are canned on the day they are picked. If properly canned, they are heated in a vacuum, that is, without the presence of air. By this means practically all the vitamins are saved. Because of the nutritive value of most canned foods we may have meals with more variety at no greater cost than if we had to depend on fresh foods alone. This is especially true in the country, where a great variety of fresh vegetables and fruits may not be found in the grocery stores all through the year.

It is a good idea to try different brands of canned goods to find out which ones are best liked and best suited to the family's needs. Compare the contents of the cans for food value. A can of peas of one brand, for example, may appear to be cheap as compared with a can of peas of another brand, but the cheaper can may contain more water and fewer peas than the more expensive can. What is saved in pennies may be lost in peas! Watch also to see whether widely advertised brands are more expensive than brands that are seldom advertised. It costs money to advertise, and this cost may be reflected in prices.

In buying food some things are worth paying for and others are not. For example, paying more to get white eggs instead of brown is not worth while, since brown eggs are exactly as nutritious as white ones. Small heavy oranges are just as good for juice as the beautiful expensive ones. Cooking apples make fine applesauce and are less expensive than the big red-cheeked dessert apples. In general, it is better to buy for nutritive value, instead of flavor or appearance, when the food money is limited. Very often good cooking and dainty serving will go a long way in

making up for the necessity of using the cheaper cuts of meat and the less choice vegetables and fruits.

Sometimes, however, what seems to be a bargain is not a bargain at all. Meats in which there is a great deal of waste, partly spoiled fruits and vegetables, very small apples and potatoes and other fruits and vegetables that practically disappear under the peeling knife, prunes that are all "skin and bone" are not bargains at any price.

MEAL-PLANNING

In planning meals we must not only plan to fill our stomachs but also to provide our bodies with all the food elements that are necessary for good health. The planning of meals depends a great deal on the availability of certain foods at certain times in certain localities, on the amount of money the family has to spend for food, and also on the ages and occupations of the people in the family.

It is best to consider the day as a whole rather than to plan for one meal at a time. Plans for using leftover food should be made first. Often it is possible to combine leftover meat or fish with some other food in order to make a main dish for lunch or dinner. Leftover canned or fresh fruit may be used in making simple desserts. Leftover cooked vegetables, such as beets, carrots, or string beans, may be combined with lettuce and dressing to make a tasty salad.

The outline on pages 100–101 indicates in a general way balanced meals for one day. The cuts of meat and the kinds of fresh fruits and vegetables to be served depend on the season and on the amount of food money available. Eggs should be served at least four times a week, meat four times a week, and fish, oysters, or clams once a week. A fish-liver oil in liquid or capsule form should be taken daily

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Juiciness rather than size is the thing to look for when buying oranges for orange juice

KODACHROME BY STEVEN A. COONS

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Gendreau

One place at the dinner table properly set

during the late fall, winter, and early spring months unless your doctor wants you to get your supply of vitamin D by drinking vitamin-D milk instead of plain pasteurized milk. In general it is best to provide the foods that supply sufficient vitamins, minerals, and proteins and then to add fat and carbohydrate foods to make up the number of calories required by each member of the family.

TABLE ETIQUETTE

You will sit at the table three times a day, usually in the presence of other people, all your life long. People who do not know how to behave at the table may make themselves and others thoroughly miserable. At home your family may overlook bad table manners and like to have you around in spite of them, but outside the home people with bad manners are not welcome as table companions.

As an introduction to table etiquette we may begin with the setting of the table. From experience we know that a table laid with a clean cloth, or doilies, and with shining silverware, glasses, and china is in itself a pleasing invitation to dine. In placing the silverware, usually the knife is placed to the right of the dinner plate and the spoons

Breakfast

Sample Menu	Variations
1 orange	Any other fresh fruit or fruit juice or tomato juice; or a stewed fruit if fresh fruit is eaten at another meal during the day
1 dish of oatmeal with whole milk and a spoonful of sugar	Any other cooked dark cereal. Occasionally, for the sake of variety, a ready-to-eat cereal, such as corn flakes or puffed wheat, may be substituted
2 slices of toast with butter	Bread, rolls, or muffins, preferably made of whole wheat or some other whole grain. Marmalade, jam, jelly, or honey may be added
1 glass of milk	Cocoa made mostly of milk
1 egg, boiled, poached, or scrambled	Broiled bacon with egg if desired. Or omit the egg and eat more of the other foods

Luncheon or Supper

Sample Menu	Variations
1 dish of vegetable soup with crackers	Any cream soup; or a made dish, such as macaroni and cheese, baked beans, or Spanish omelette
2 cottage-cheese sandwiches made of whole-wheat bread	Any other good sandwich filling, such as peanut butter, jelly, hard-boiled eggs, cold meat, lettuce, or tomato. Omit sandwiches and serve plain bread and butter if a hearty made dish is used instead of soup as the hot dish
1 glass of milk	Cocoa made mostly of milk
1 large baked apple with top milk	Any other fruit stewed or fresh; or a simple dessert, such as custard, rice pudding, Spanish cream, cornstarch pudding, junket, ice cream, or fruit gelatin

Dinner

Sample Menu	Variations
1 cup of clear soup	Any other appetizer, such as fruit cocktail, sauerkraut juice, clam juice, fruit juice, or tomato juice. Or omit, as an appetizer is not essential
1 serving of roast lamb with currant or mint jelly	Any other meat, roasted, broiled, or boiled (not fried); or any kind of fish or poultry; or eggs; or a cheese dish
1 large baked potato with butter	Potatoes, mashed, boiled, or creamed; or macaroni or rice
1 or 2 servings of green string beans with butter	Any other cooked vegetable served with cream sauce or butter. Use green and yellow vegetables frequently. Use the water in which the vegetables were cooked for sauces or soups
1 liberal serving of lettuce and tomato salad with dressing	Any raw vegetables or fruit in a salad; or celery, watercress, raw carrots split lengthwise, young raw onions, or radishes
Graham bread and butter	Any whole-grain bread, rolls, muffins, or crackers
1 glass of milk	Cocoa made mostly with milk
1 serving of chocolate cornstarch pudding with top milk	Any other simple dessert; or fruit stewed or fresh

are placed to the right of the knife. The water glass also stands to the right. Forks are placed to the left of the dinner plate. In front of and slightly to the left of the forks the small bread-and-butter plate is placed. The salad plate also stands at the left. You will not make the mistake of eating your neighbor's salad if you remember that your salad is on your left.

Try to practice what Gelett Burgess calls "invisible eating." To illustrate what he means he tells this story: "I once asked a child how she knew that a person she had met at dinner was used to refinement. 'Oh,' she said, 'he seemed to be just talking and having a good time. And yet his plate was nearly empty when they took it away.'"

Sit up straight at the table. Do not slump down in your chair or sprawl forward with your elbows on the table top. Unfold your napkin quietly; do not shake it out as if it were a sheet to be hung on a clothesline. Place the napkin across your knees and use it only to wipe your mouth or your fingers. Do not tuck it into your neck as if you were having a haircut.

Do not play with the china or silverware or drum on the table with your fingers or shuffle your feet on the floor. Fidgeting at the table is very annoying to other people. Eat quietly. Chewing with the mouth open or making smacking noises with the lips or tongue are unpleasant habits. Shoveling food into the mouth rapidly and swallowing it half chewed makes a person look greedy and is bad for the digestion.

Eat everything that is served to you, if possible. It is good manners to ask for more if you want it and are sure you can eat it. It pleases a hostess to have the food appreciated. Learn to like all kinds of foods and styles of cooking. However, if you are invited out to dinner and are served with food you do not like or that you know is bad

for you, you are not obliged to eat it. But do not shove the food away, or say "I don't like it," or act surprised when you are served something with which you are not familiar. It hurts the feelings of a hostess to have criticisms made of the food she has provided. Always remember that good manners are based on consideration for other people.

Ask to have articles on the table passed to you when you need them and remember always to say "please." It is very bad manners to reach across the table for the salt or sugar or jam dish or to harpoon bread with a fork.

Soup, vegetables served in juice, stewed fruits, berries, cantaloupes, halved grapefruit and oranges, and soft desserts, such as ice cream and custard, are eaten with a spoon. When eating soup dip the edge of the spoon away from you in order to fill it and take the soup into your mouth from the other side of the spoon. Tip up the spoon so that the soup flows into your mouth; don't suck it up. When soup is served in a cup with a handle, use the soup spoon first. Then when the cup is partly empty, it is proper to drink directly from the cup. When you are not using the soup spoon lay it on the plate that is under the cup. Never leave a spoon in a cup or bowl. It is not good form to blow on soup in order to cool it or to tip up a soup plate to scoop out the last drop.

Bread and butter, dry sandwiches, crackers, solid cheese, olives, small cakes, celery, radishes, corn on the cob, and many raw fruits are taken up with the fingers. Nearly all other foods are

Keystone

What part of the process of eating soup is this girl doing correctly?

eaten with a fork. When cutting meat, the knife is held in the right hand and the fork in the left. Cut only enough for one bite at a time. A piece of meat just cut may be placed in the mouth with the fork held in either the left hand or the right hand. The fork held in the right hand should be used in eating vegetables. Salad is cut and eaten with a fork. If head lettuce is very solid, the knife may be used to cut it; but cut off only one bite at a time.

Place the knife and fork side by side on the right-hand side of the plate with the handles toward you when you are not using them or when you have finished eating. Never prop up a knife or fork against the edge of a plate with the handle resting on the table.

If a butter-spreader is provided, always place it across the bread-and-butter plate when you are through using it. In taking butter from a bread-and-butter plate use a knife, not a fork. In eating bread or rolls break off and butter one piece at a time. Never hold a whole slice of bread on the palm of your hand and smear it over with butter. If celery,

The girls in this homemaking class are eating a meal that they have prepared and are at the same time practicing what they have learned about table etiquette

olives, jelly or jam, soft cheese, or pickles are served, place them on the bread-and-butter plate. Olive pits and the parts of celery not eaten should be left on this plate.

Practice the fine art of table conversation. Talk at the table should be gay, witty, and as general as possible. To talk of one's work or one's worries is just as likely to cause stomach-ache as to eat heavily of indigestible food.

It is discourteous to introduce a disagreeable topic of conversation that might cause bad tempers and consequently bad digestion. Good table manners and the good table talk that gives them grace are won through practice. Home is the place to practice them. Your father is your host and your mother your hostess. You have it in your power to be the gracious guest until the time comes when you are host or hostess in your own home.

Always remember that it does not cost anything to have good manners at the table or anywhere else. Many poor people with but little education have better manners than people who have had all the advantages that wealth and education can give them. The reason for this is that really good manners are the products of kindness, self-respect, and thoughtfulness for other people.

Good manners, based on knowing from the heart what to say and to do in any situation, even if one does not know all the rules of etiquette, will be very helpful in any career that a boy or girl chooses to follow. Ralph Waldo Emerson, a great writer, said, "Give a boy address and you give him the mastery of palaces." This means that a person with good manners can win a welcome anywhere. In this country the road to success is open to everyone. One of the first and most important steps to be taken on this road is to learn by observation and then to practice the sort of behavior that pleases the people with whom you are in daily contact.

ARE YOU DOING YOUR BEST TO HELP IN PROVIDING ECONOMICAL, HEALTHFUL, AND PLEASANT MEALS FOR YOURSELF AND YOUR FAMILY?

Do you patronize only clean stores?

If it is necessary for your family to practice economy, do you help your mother to plan ways of making the food money go a long way?

Do you keep in mind the essentials of a healthful diet when you are made responsible for buying food and planning meals?

Are you careful to get your money's worth when you are responsible for the purchase of food?

Can you plan a well-balanced meal?

When you set the table do you try to make it look attractive?

Do you practice good table manners at home?

Do you try to make mealtime as pleasant as possible for yourself and your family?

TRY THESE TESTS

1. Choose the best ending for each of the following sentences. (*Do not write in the book.*)

a. In choosing a grocery store to patronize the most important things to consider are · (1) the politeness of the storekeeper and the cheapness of the food · (2) the cleanliness of the store and the assurance of getting good value for money spent · (3) convenience in shopping and delivery service.

b. We buy energy chiefly when we buy · (1) bread, potatoes, sugar, and butter · (2) meat, cheese, and eggs · (3) lettuce, cabbage, carrots, and oranges.

c. Scurvy is caused by a lack in the diet of · (1) pasteurized milk (2) cod-liver oil · (3) raw fruits and vegetables.

d. In setting the table the knife is placed · (1) to the right of the place for the plate · (2) to the left of the fork · (3) to the right of the spoons.

2. Complete the following sentences by supplying the missing words. (*Do not write in the book.*)

a. The law of __?__ and __?__ and the cost of __?__ and __?__ affect the price of foods.

b. __?__ __?__ invented the canning of food.

c. It is better to consider __?__ value rather than flavor or appearance when the food money is limited.

d. We can make better choices of food than our ancestors could because we have the science of __?__ to guide us and because we have better __?__ facilities and better methods of __?__ food.

e. In planning meals it is best to provide first foods that supply sufficient __?__, __?__, and __?__ and then to add fats and carbohydrates to make up the __?__ requirements of each individual.

THINK ABOUT THESE QUESTIONS

1. How does a knowledge of nutrition help in the planning of meals? What are the food essentials to be considered in purchasing food and in daily meal-planning? What other things besides the essentials of a healthful diet is it necessary to think about in planning meals?

2. Which foods do we buy chiefly for energy? for protein? for minerals? for vitamins? for roughage? What happens in

the body when any one of the vitamins is lacking in the diet? What happens when we do not eat enough foods containing roughage?

3. A good rule recommended by Sherman, an authority on nutrition, is that at least as much should be spent for milk, cream, and cheese as for meats, poultry, and fish; and at least as much should be spent for fruits and vegetables as for meat, poultry, and fish. Why is this a good rule?

4. Why is it important to know how to judge the quality of foods offered for sale? What are some of the advantages of canned foods as compared with fresh foods?

5. How are good food habits formed? Are there any food habits you need to form? In what ways can you help yourself to form these habits?

6. What is the arrangement of the dishes, glasses, and silver on a correctly set table? How do the table manners of others affect you? What are some of the ways in which your conduct at table may affect other people?

DO THESE THINGS

1. The following list gives the smallest amounts of the different kinds of food that a family of five with three children under twelve years of age should use in one week in order to have all the essential food materials in their daily meals. Appoint committees of boys and girls to visit various grocery stores and meat markets in the community and get the prices of foods in this list. Then figure out how much the family pays each week for food. The amount of milk is left blank so that you may figure out the amount needed yourself. The father and mother must each have a pint of milk a day and the three children must each have a quart. How much milk will the family need for the week? Part of the milk may be used in cooking. The milk may be all bottled pasteurized or part bottled and part evaporated. One tall can of evaporated milk equals one quart of bottled pasteurized milk. Copy this list on a separate sheet of paper in order to do your figuring. (*Do not write in the book.*)

Amount of Food	Kinds of Food		Cost
__?__ qt.	Bottled pasteurized milk	at __?__¢ per qt.	$__?__
__?__ cans	Evaporated milk . . .	at __?__¢ per can	__?__
14 lb.	Potatoes	at __?__¢ per lb.	__?__
3 cans	Tomatoes (large size) .	at __?__¢ per can	__?__
3 lb.	Cabbage, spinach, kale, or any other green leafy vegetable in season .	at __?__¢ per lb.	__?__
2 lb.	Carrots or yellow turnips	at __?__¢ per lb.	__?__
1 lb.	Onions	at __?__¢ per lb.	__?__
4 lb.	Other vegetables (fresh or canned)	at __?__¢ per lb.	__?__
2 lb.	Dried beans, peas, or lentils	at __?__¢ per lb.	__?__
1 lb.	Prunes	at __?__¢ per lb.	__?__
1 lb.	Other fruit (dried or fresh)	at __?__¢ per lb.	__?__
4 loaves	Bread (dark)	at __?__¢ per loaf	__?__
3 loaves	Bread (white)	at __?__¢ per loaf	__?__
1 box	Oatmeal	at __?__¢ per box	__?__
1 lb.	Other whole-grain cereal	at __?__¢ per lb.	__?__
2 lb.	Butter	at __?__¢ per lb.	__?__
1 lb.	Lard	at __?__¢ per lb.	__?__
3 lb.	Sugar	at __?__¢ per lb.	__?__
2 lb.	Macaroni, spaghetti, or barley	at __?__¢ per lb.	__?__
2 lb.	Brown rice	at __?__¢ per lb.	__?__
2 lb.	Flour	at __?__¢ per lb.	__?__
½ lb.	Cheese	at __?__¢ per lb.	__?__
1 doz.	Eggs	at __?__¢ per doz.	__?__
1 can	Salmon	at __?__¢ per can	__?__
1 lb.	Liver, beef, lamb, or pork	at __?__¢ per lb.	__?__
1 lb.	Chopped meat . . .	at __?__¢ per lb.	__?__
1 lb.	Stew meat	at __?__¢ per lb.	__?__
	Seasoning, cocoa, gelatin, etc.	about 30¢ worth	.30
		Total	$__?__

2. Which foods listed in problem 1 will be the family's chief source of protein? of fat? of sugar? of starch? of vitamins? of minerals? of roughage? Why are coffee and tea not given in the list? Why are beer and wine left out?

3. Here are menus for one day which supply at very low cost food materials the body needs:

Breakfast	Lunch or Supper	Dinner
Milk	Bean soup made with evaporated milk	Stew made with stew meat, potatoes, onions, and carrots
Oatmeal	Whole-wheat bread and butter	Bread and butter
Whole-wheat bread and butter	Raw-cabbage salad	Brown-rice pudding
	Milk	Milk

Using the foods listed in problem 1, plan some other low-cost healthful meals.

4. Here are menus for one day which will cost more to prepare than the menus given in problem 3. Why do they cost more?

Breakfast	Lunch or Supper	Dinner
Grapefruit	Cream of tomato soup	Fruit cocktail
Corn flakes with top milk	Crackers	Roast beef
Whole-wheat toast and butter	Cream cheese and pineapple salad	Baked potato
Milk	Whole-wheat bread and butter	Green string beans
	Cocoa	Head-lettuce salad
		Corn muffins and butter
		Cookies
		Ice cream
		Milk

Plan some other healthful meals that cost a little more than the low-cost meals you have planned.

5. Trace a food, such as milk, eggs, beef, apples, oranges, or any canned food, from the place where it was produced to the home where it is consumed. Be prepared to tell the class how the cost of production, packing for shipment, transportation, and marketing may be expected to affect the price.

6. As a class activity, compose and act a play illustrating correct setting of a table, good table manners, and pleasant, witty table conversation.

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

calorie	anemia	nicotinic acid
calcium phosphate	xerophthalmia	availability
cellulose	night blindness	refinement
pigment	beriberi	nutritive
carotene	scurvy	concentrated
rickets	pellagra	characterized
simple goiter	vitamin-D milk	

2. From the list above choose the name of a disease caused by a lack of each of the vitamins; of calcium or phosphorus; of iron; of iodine.

3. From the list above choose the word or words you associate with each of the following:

vitamin G	heat and energy
the manufacture of vitamin A	the forming of bones and teeth

UNIT V

Narcotic Drugs and Self-Medication on Trial

Among the berries, fruits, insect larvae, worms, shellfish, reptiles, dead animals, and other foods that primitive people ate when driven by hunger there were undoubtedly some articles of diet that caused illness or even death. It must have taken many years before man learned to avoid harmful or poisonous foods. However, people still take into their bodies certain chemical substances which, as the ingredients of medicine prescribed by a doctor, are useful in treating illness, but which may be very harmful if used by people who know nothing about medicine. These substances are called drugs.

There are certain drugs which many people take on their own responsibility. These drugs are called narcotic drugs. A narcotic is a substance which has a powerful dulling effect on the nervous system. Alcoholic beverages, preparations of opium and cocaine, some patent medicines, marijuana cigarettes, and smoking tobacco all contain narcotics to a greater or less degree.

As the use of substances containing narcotic drugs may have serious consequences, every person ought to know the answers to certain questions about them before deciding to drink or to smoke or to dose himself with a medicine without a doctor's advice.

DO YOU KNOW

How alcohol is produced?

Why alcohol weakens self-control?

How drinking alcohol affects driving a car?

Whether alcohol can cure disease?

Whether people who drink live longer than people who do not drink?

Whether the taxes collected on the sale of alcohol are a benefit to the nation?

Why young people should wait until they are twenty-one before deciding whether or not to smoke?

What is meant by habit-forming drugs?

Why it is so hard to control the traffic in habit-forming drugs?

What self-medication is and why it should be avoided?

What is meant by a patent medicine?

Ethyl alcohol is the scientific name for the substance in beverages such as wine, beer, whisky, brandy, and gin which causes the effects on the body known as intoxication. It is a poison and will cause death when there are more than five parts of alcohol to one thousand parts of blood in the body. Ethyl alcohol is produced by the action of yeast cells on a liquid containing either sugar or a starch that may be turned into sugar.

In nature wild yeast cells in the air and in the soil cause the fermentation and decay of ripe fruits and vegetables. When fruit juices, crushed grains, and grain sprouts mixed with water are placed by man in a vat or tub, the yeast cells sink deep down into the liquid and fermentation begins. The process of fermentation depends upon the need of the yeasts for oxygen. In a fermentable liquid, that is, a liquid containing sugar, a ferment in the yeast breaks up the sugar to get at the oxygen it contains. When the yeast has extracted the oxygen from the sugar, carbon dioxide and ethyl alcohol are left. The carbon dioxide is what makes the bubbles in alcoholic beverages, such as wine or beer. The ethyl alcohol is what makes the beverage intoxicating.

How Does Alcohol Affect the Body?

Ethyl alcohol usually is taken into the body as an ingredient of an alcoholic beverage. It is readily absorbed from the digestive tract and begins to appear in the blood stream within a few minutes after being taken. Unlike natural foodstuffs, except simple sugar, alcohol does not have to be digested in order to pass from the digestive tract into the blood stream. Shortly after a person has

drunk an alcoholic beverage, all the organs of his body become bathed in blood containing alcohol. The alcohol continues to exercise its effects until the larger part is oxidized, that is, burned up by the body cells. The small remainder is sent out of the body by way of the kidneys and the lungs.

The chief effect of alcohol is on the nervous system. It always acts as a depressant upon the brain, never as a

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Grapes are a delicious food.
When turned into wine, most of their food value is lost

Doris Day

stimulant. A depressant is something that slows down one or more body activities. A stimulant is something that speeds up one or more body activities. It was once believed that alcohol stimulated the brain because drinks containing it seem to make people livelier. But now we know that the reason why people seem gayer after taking one or more drinks is because alcohol depresses, or dulls, the parts of the brain that have to do with self-control.

The brain is the seat of all our thinking processes and of all our conscious behavior. The depressant effect of alcohol on the brain is to remove the influence which the higher brain centers have over our thinking processes and our behavior. As a result worries and anxieties are blotted out of the mind. After a few drinks a person no longer feels restrained by social customs. He loses the power to criticize himself. He is less keenly aware of his surroundings, and his judgment becomes less acute. In this condition a drinker very often does and says things he would never dream of doing or saying if part of his brain had not been dulled. If he continues drinking, his thoughts and speech and movements become confused.

The effect of alcohol on nervous tissue is believed to be due to the fact that the fatty substances in the nerve cells readily absorb alcohol. The presence of alcohol at the junction of the sensory and motor nerve cells in the brain and spinal cord appears to have the effect of short-circuiting, or blocking, the passage of nerve impulses along their regular routes. The general situation is such as might happen in a big railroad yard if the switchman (representing the higher brain centers) was asleep and the switches (representing the junctions of sensory and motor cells) were not set correctly. Incoming and outgoing trains (represent-

Does this girl have good control over her muscles? How does the presence of alcohol in the brain and spinal cord affect muscle control

Black Star

ing the nerve impulses) would get on the wrong tracks or pile up at the switches, and the switchman would not care or even know what was happening, because he was asleep.

It takes many years to gain control over body movements and behavior. As babies you had to learn to stand erect and to walk and to control your hands in order to feed yourself. As you grew older you gained muscle control in running, in playing ball and other games, and in using tools. You learned not to run and jump and talk or laugh loudly when by doing so you would appear conspicuous or ridiculous. Growing up means the growth of self-control and of good judgment and of a sense of responsibility as well as growth of body. Alcohol weakens mastery over self so that under its influence many of the good things the self has gained through long years of effort are thrown away.

Does Alcohol Sharpen the Senses?

Even after taking small amounts of an alcoholic beverage the drinker often does not see or hear or recognize things by touch so well as he did before. This does not mean that alcohol affects the sense organs directly, but that the messages received from the outside world are mixed up in passing over the nerve networks or are not interpreted correctly because of the deadening effect of alcohol on the brain. The most striking illustration of the disasters this may cause is the relation between drinking and automobile accidents.

Alcoholic drinks, which dull the keen edge of a driver's perceptions, frequently cause fatal errors in judgment. Official reports of 1937 indicate that 8 per cent of the drivers and 13 per cent of the pedestrians in fatal motor-vehicle accidents were either intoxicated or "had been drinking." It has been proved by scientists that even moderate drink-

ing may cause a driver to make mistakes because even the slightest delay in responding to danger signals received by the eyes and ears may cause an accident.

Does Alcohol Lessen Fatigue?

The fatigue, or tiredness, you feel after using your muscles in hard work or play comes from two things: (1) the accumulation in the body of waste substances that act as poisons and (2) a loss of food material used up by the muscles as they work. Rest gives a chance for the blood to carry the fatigue substances to the kidneys and the lungs for removal from the body, and also to carry fresh supplies of food substances to the muscles.

Some people think that an alcoholic drink lessens the feeling of fatigue because of the pleasant feeling of relaxation which results from the depressant effect of alcohol on the brain. A tired person who has taken a drink may think that he can do more and better work because, for the moment, he feels refreshed. But the opposite is true.

Alcohol in the blood slows up the processes by which the body gets rid of the waste substances produced during hard exercise. Thus instead of helping to lessen fatigue, alcohol actually increases it. The "hang-over" (which is the expression used to describe the headache and the feeling of wretchedness experienced after recovery from a heavy drinking spree) is caused by the piling up of waste substances in the blood stream.

Sir Frederick Treves, a famous British surgeon who served during the Boer War in South Africa, tells this story as an illustration of the effect of alcohol in increasing fatigue. An English army was hurrying from the seacoast to relieve the city of Ladysmith, many miles away, where another body of English soldiers was holding out

against capture. The marching soldiers suffered severe hardships, partly because they were obliged to hurry in the midst of hot weather to which they were not accustomed. Sir Frederick Treves said of them: "In that enormous column of thirty thousand men, the first to drop out were not the tall men, or the short men, or the big men, or the little men; they were the drinkers; and their dropping out was as clear as if they had been labeled with a big letter D on their backs."

The reason why athletes are not allowed to use alcohol while in training is because they cannot expect to win if they tire quickly. Candy and sugar are the best sources of a quick supply of energy. This is why ballplayers, mountain-climbers, and other athletes often suck sugar lumps or eat chocolate.

Does Alcohol Help People to Work Better?

Many people think that they work harder and more skillfully after taking a drink containing alcohol than they did before. There is nothing to show that this is true in the studies made by scientists of the effect of alcohol on muscle control, learning and memory, attention and concentration, and thinking and reasoning. Some of the tests by which scientists have shown that alcohol lessens rather than increases the ability to work rapidly and accurately are very interesting.

For instance, two British scientists wanted to test the effect of alcohol on self-control and on the ability to pay close attention. They used a machine called a dotting machine. A small opening was made in the top of a desk. Underneath was a roll of paper tape which was

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The top at last! Would these mountain-climbers look so fresh ar happy if there had been whisky instead of water in their canteen

Galloway

rapidly moved along by clockwork. There were twelve hundred small red circles and about ninety blue circles printed on the tape. As the tape moved, the circles appeared in the opening one at a time.

With a pen held in her right hand the person being tested was supposed to dot each red circle as it appeared in the opening. She was to leave the blue circles undotted, but she was required to make a mark on the tape with a pen held in her left hand in order to show that she had recognized the blue circle and had purposely left it undotted. She had only a fraction of a second in which to decide whether to dot or not to dot. Because there were so many red circles the natural impulse was to dot; so self-control was needed to avoid dotting the blue circles.

Different quantities of alcohol were given during the experiments, all the way from the amount of alcohol in a little less than three tablespoonfuls of strong wine to slightly less than the amount in seven tablespoonfuls. Even with the smallest amount of alcohol there were 21 per cent more mistakes made on the days that alcohol was taken than when none was taken. With the largest amount of alcohol there were 131 per cent more mistakes. Alcohol weakened the ability to pay attention to work that required quick and accurate decision. It also lessened the power of control.

Is Alcohol "Good Medicine"?

The use of alcohol as medicine began many years ago when very little was known about the effect of drugs. As alcohol made sick people feel better, it seemed natural to believe that it helped to cure them. But at last it was proved that most of the claims made for the value of alcohol as a medicine are not true. Many physicians now believe that there are very few conditions that are helped by the

use of alcohol. So many better methods of treating illness have been discovered in recent years that the wide use of alcohol in medical practice no longer exists.

Snake bite, for example, is no longer treated by forcing the victim to swallow large quantities of whisky. The alcohol in the whisky has no effect on snake venom. Brandy or whisky was formerly used to revive a person who had fainted. It was the burning taste of the liquor that roused the patient. Today we know that the smell of ammonia, or even the smell of a burnt feather, will have the same effect.

Many people think it is a good thing to take a drink of whisky or gin to keep from catching cold. But alcohol really makes the body cooler, although the drinker feels warmer. Alcohol in the blood causes the blood vessels in the skin to dilate, that is, become larger. Hence more blood passes from the warm interior of the body to the enlarged vessels in the skin. The nerve endings in the skin report a sensation of warmth to the brain, and the person thinks that he is warmer. Instead, the increased volume of warm blood in the skin leads to the radiation of more heat from the body and therefore to a lowering of the body temperature. Pneumonia is more frequently found among those who drink alcoholic liquors than among those who do not.

Pharmacists often use alcohol in making up medicines prescribed by doctors because many drugs that cannot be dissolved in water will dissolve in alcohol. Used in this way alcohol is very valuable. But many ready-mixed medicines which may be purchased without a doctor's prescription contain a great deal more alcohol than is required to dissolve the drugs used. As alcohol tends to deaden feelings of discomfort, this doubtless explains the wide use of patent medicines of this kind. Such medicines fool people into thinking that they are being cured. The great danger in

their use lies in the fact that they may cause the patient to delay too long in seeking the treatment he really needs or that he may form a habit that will be hard to break.

Is Alcohol Nutritious?

Alcohol can do only one thing that a food can do; it supplies energy which is available as heat and as fuel for work. It cannot, like the common foodstuffs, become part of the body either as tissue or as material stored for future use. For this reason it would be more exact to call alcohol a fuel rather than a food. But although alcohol burned in the body supplies energy, this energy costs more in dollars and cents than does the same amount obtained from true foods. It would cost you four and a half times as much to buy a certain number of calories' worth of energy in the form of beer as it would to buy it in the form of milk. Then, too, milk not only provides energy but it also supplies practically all the essential food elements needed by the body. Although fruit juices are not so rich in food value as milk, they are a good source of sugar and vitamins. But when fruit juices, such as grape juice or apple juice, are turned into alcoholic beverages, they lose a large part of their nutritive value.

The most telling argument against using alcohol as a food is the fact that it weakens the normal working ability of the body. Doubtless poisonous mushrooms and poisonous berries of various kinds have food value, but we do not call them foods because they do more harm than good. Although alcohol supplies the body with a certain amount of energy, we may not call it a food, because its fuel value is more than offset by its depressant effect on the nervous system.

Does Alcohol Have Any Effect on Length of Life?

Once in a while we read in the newspapers that someone who has lived to a good old age has used alcoholic beverages freely all his life. This, of course, is no proof that the average person would not have his life shortened by the continuous use of alcoholic beverages. It is only the exceptional person who lives to be ninety years old or more, and a great many other factors besides drinking or not drinking whisky or beer may account for his achievement. We can-

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Why does a pharmacist sometimes find alcohol useful in making up a medicine prescribed by a doctor?

Black Box

not write out a recipe for long life as we can write out a recipe for a cake, although some old folks like to think that one thing or another is the secret of living to great old age.

One of the principal sources of information regarding the effect of alcohol on length of life is the records of reliable life-insurance companies. In applying for insurance a person is asked whether he uses alcoholic beverages and, if so, to what extent. It is possible, therefore, for an insurance company to classify policyholders as nondrinkers, moderate drinkers, and excessive, or heavy, drinkers.

The records show that on the whole total abstainers, that is, those who never touch alcohol, live longer than do non-abstainers. Those who report that they drink moderately —an average of two glasses of beer or one glass of whisky a day—are shorter-lived than the average person. This is due partly to the fact that a certain percentage of people who say they are moderate drinkers when they apply for insurance become heavy drinkers later on. In other words, some people who start by drinking only a little end by drinking a great deal. Those who drink to the point of intoxication are distinctly shorter-lived than the average.

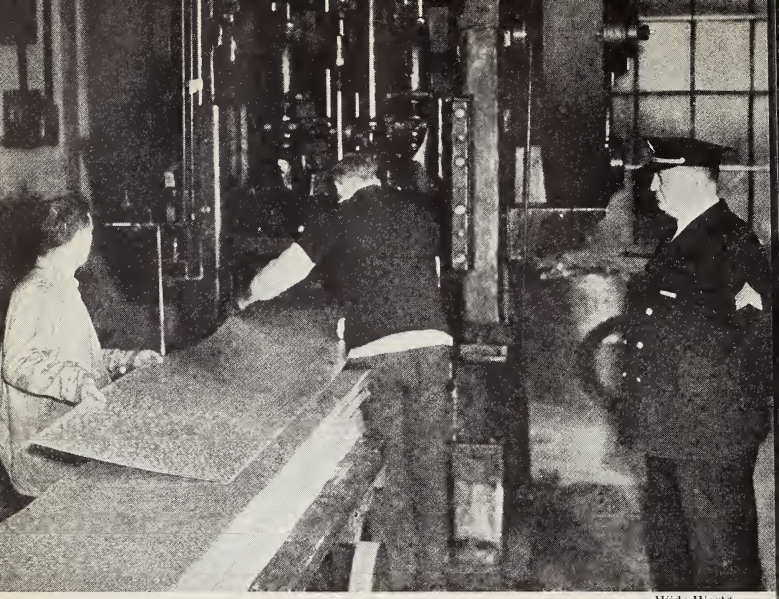
Is Alcohol a Help or a Burden to the Community?

One argument for the licensed sale of alcoholic beverages is that the taxes collected on their manufacture and sale are a big source of government revenue. Taxes are imposed and used to meet the expenses of government. If the sale of a taxed commodity increases government expenses beyond the amount of the taxes imposed on it, then the sale of the commodity means money loss to the government instead of money gain. Part of the expense of government is the support of courts of law, police departments, prisons, re-

formatories, poorhouses, institutions for the insane and mentally defective, public relief of poverty, and some hospitals. Does the sale of alcoholic beverages cost the government more than it receives in taxes on alcoholic beverages by increasing government expenditure for law enforcement and for the care of the poor, the mentally defective, and the sick?

It is very difficult to trace a direct relationship between the misuse of alcohol on the one hand and vice and crime on the other. It may be said that a person who has committed theft or murder or some other crime while under the influence of alcohol would have done it anyway. He might be a criminal by nature or a criminal because of his bringing up or his surroundings. The general opinion among scientists seems to be that while it may be impossible to place all the blame on alcohol for a major criminal act, such as planned murder or robbery committed under the influence of alcohol, there is undoubtedly an indirect relationship in a great many cases. Certainly anything which disturbs the normal working of body and mind, as alcohol undoubtedly does, may result in a situation from which a criminal act may spring.

There is no question as to the relation between the misuse of alcohol on the one hand and disorderly conduct, minor offenses against the law, mental defectiveness, and poverty on the other. If the breadwinner of a family is a heavy drinker, it is almost impossible to have a happy home life. Money which is needed for food, clothing, shelter, recreation, and the education of the children is likely to be spent in helping one person to forget his responsibilities. It often happens that a habitual drinker loses his job because the use of alcoholic beverages has lessened his skill or has made him careless about his work. A drunken person is not a pleasant person to have around. Too much alcohol may



Wide World

Occupation in a prison. Prisons and reformatories are paid for by taxes. Why does the sale of drinks containing alcohol cost the government more than it receives in taxes on such beverages?

make the drinker quarrelsome or cruel or silly. A person in a drunken stupor, or heavy sleep, is a disgusting spectacle.

No matter what arguments may be advanced on the side of moderate drinking, remember always that moderate drinking may lead to heavy drinking and that one drunkard in a home is enough to wreck the happiness and the self-respect of the family. It has been estimated that from 15 per cent to 25 per cent of the homes helped by charity in times of prosperity were in distress because of the intemperate use of alcohol by some member of the family.

It is foolish to say that the revenue received by the government from the sale of intoxicating liquors benefits the

government. The gain is more than lost in the cost of trying to cure the social ills, crime and vice and poverty, that arise from the misuse of alcohol.

TOBACCO ON THE WITNESS STAND

The appeal of tobacco-smoking, like that of alcohol-drinking, is produced by the effect which a narcotic has on the nervous system. However, the narcotic effect of tobacco smoke is not nearly so powerful as that of alcohol. The habitual smoker may smoke all during his waking hours without noticing any particular difference in the way he feels. It is only when he cannot smoke that he notices the difference smoking makes. Then he is likely to feel fidgety and nervous until he is able once more to light a cigarette or cigar or pipe. The smoke from the tobacco has a relaxing effect which the habitual smoker misses when he is deprived of it. Tobacco, therefore, is a tyrant. It is a mild tyrant compared with alcohol, but even so it has the power to make its users uncomfortable when for some reason they are not allowed to smoke.

Tobacco smoke is a very complex mixture. The substance that gives it its narcotic effect is nicotine. This drug has a definite toxic, or poisonous, influence on the heart. Young people are more sensitive to it than are adults. It disturbs the normal rhythm of the heart by making it beat too fast or skip beats, and it interferes with the efficiency of the nervous system. There is about six tenths of one per cent of nicotine in tobacco smoke, much of which is absorbed by the body of the smoker. In puffing, about 66 per cent is absorbed; in inhaling, about 88 per cent.

Tobacco smoke is irritating to the delicate lining of the nose and throat. A husky voice and an annoying cough are

sometimes caused by excessive smoking. Because smoking often interferes with breathing, athletes in training are forbidden to smoke. It is impossible to be a good runner or a good swimmer or a good climber if one quickly gets out of breath.

Tobacco smoke may dull the senses of taste and smell. Food does not taste so good to the habitual smoker as it does to people who do not smoke. In some cases chronic indigestion has been caused by excessive smoking, because of the effect of tobacco smoke on the glands in the mouth and stomach that secrete digestive juices. Excessive smoking also has been known to injure the eyesight.

Fields of tobacco plants

Galloway

Because smoking appears to have a much more serious effect on growing boys and girls than it has on adults, a very sane rule to follow is the traditional one that says young people should not smoke until they are twenty-one. Then they may decide for themselves whether to smoke or not. In making this decision it is well to remember these facts: Tobacco-smoking is unnecessary. It is expensive. It carries with it the known danger of possible injury to the normal functions of the body. It is a drug habit, and, like any drug habit, it becomes a tyrant. Besides these indictments you may add that it is an unnatural habit which may at times become very inconvenient.

THE CASE AGAINST OPIUM, COCAINE, AND MARIJUANA

Besides ethyl alcohol and the nicotine in tobacco smoke, there are other narcotic drugs which have a far more dangerous effect on the body. The principal narcotic drugs of this kind are opium and cocaine. They are valuable when prescribed by physicians and surgeons for the relief of pain and some other conditions, but their habitual use leads actually to the destruction of body and mind.

Opium is made from the milky sap of the opium poppy. It comes mostly from Oriental countries. The preparations of opium chiefly used in medical practice are morphine, codeine, and heroin. Cocaine is made from the leaves of the coco plant. This plant is not to be confused with the cacao plant, from the seeds of which cocoa and chocolate are made. Cocaine and preparations from it, such as novocaine and procaine, are used chiefly to deaden the pain of minor operations such as the removal of tonsils, the pulling of teeth, and the lancing of boils.

Opium and cocaine are truly habit-forming drugs in the sense that it becomes impossible after a while for their users to do without them. It is possible, although difficult, to break the habit of drinking alcoholic beverages or of smoking tobacco. But opium or cocaine to the addict, or habitual user, is an absolute necessity, just as food, drink, and air are necessities. So intense is this need that the addict will lie, steal, even murder to get the drug his body craves. Addicts may be cured; but the cure is a long and painful process, because the body of an addict is as much affected

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Picking opium poppies in China.
What are the principal preparations of opium?

Keystone

The coco plant.
What narcotic drug is made from its leaves?

by the drug as is the body of a person attacked by a serious disease.

In order to protect the citizens of the United States and Canada from the danger of forming the drug habit, laws have been enacted forbidding the importation and sale of opium and other narcotic drugs in these countries except as provided by law. The lawful use of habit-forming drugs is thus controlled. The druggists in both countries must keep careful records of all doctor's prescriptions which call for any preparation of opium, cocaine, or other narcotic. It is against the law to sell medicines containing narcotic drugs. Paregoric, which is a mild preparation of opium in sirup and which, before the government control of narcotic drugs, was an ingredient of a great many soothing sirups for babies, can now be sold only on a doctor's prescription. Heroin was once widely used in patent cough medicines, but its sale without a doctor's prescription is now prohibited by law.

One way in which a person may become an addict of opium or cocaine lies in the secret sale by unscrupulous persons of narcotic drugs which have been smuggled into the country. Some of these smugglers are addicts themselves. They have become so lost to decency and honor that they try to get others to use the drug that has caused their downfall.

What is Marijuana?

Marijuana is the Mexican name for the dried leaves and flowers of the hemp plant. This plant contains a very dangerous narcotic drug called hashish which has a reputation as evil as that of opium. Its effect is to depress the central nervous system, with the result that the individual becomes irresponsible and loses all power to control his behavior. Under its influence people have committed the most brutal crimes. Our word *assassin* comes from the Arabic word *hashishin,* which means "hashish-eater."

In America the effects of hashish are obtained through smoking marijuana cigarettes which are called by different names in different localities. Among the many aliases of marijuana cigarettes are "reefers," "loco weed," and "Mary Warners."

The smoking of marijuana was introduced into the southwestern part of the United States from Mexico only a few years ago. Since then the practice has spread rapidly northward and eastward. Worst of all, it is being taken up by high-school boys and girls and young men and women. In some cities drug-peddlers encourage children of school age to smoke marijuana by giving the children cigarettes until a craving for the drug has developed.

By International News.
Courtesy American Medical Association

The hemp plant from which marijuana cigarettes

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Learn to recognize the hemp plant from which marijuana cigarettes are made

are made is hardy and can be grown successfully almost anywhere in America. Although it is useful in many ways, the dangers of marijuana-smoking are so great that the growing, selling, or possession of the hemp plant is now being limited by law. Because marijuana has only recently become a menace, its possession and sale are not regulated by the anti-narcotic acts now in force. But government officials are helping local police officers to stamp out the use of this vicious drug by enforcing local laws against its possession and sale. There are several ways in which you can help. Learn to recognize the hemp plant. If you find it growing in fields, vacant lots, or along river banks, notify the police. Under no circumstances accept cigarettes from strangers; and teach younger children to obey this rule. Do not accept from anyone, even if you know him, a cigarette or a "reefer" that is guaranteed to give you a new experience of some kind. Promising something pleasant is one of the principal ways in which a young person is led to form the vicious habit of marijuana-smoking.

THE DANGERS OF SELF-MEDICATION

Self-medication means taking medicine without a doctor's advice. A person usually takes a medicine to relieve some sort of physical distress; but a person who has not studied medicine cannot be expected to know what sort of medicine he needs. For example, he may take aspirin for a headache when he really needs a laxative. He may take a cold medicine to "dry up" a cold when he really needs something to increase the drainage from his nose or bronchial tubes. One of the greatest dangers of self-medication lies in the fact that valuable time may be lost before proper treatment by a physician is received. More-

over, there are some medicines, especially those which act on the heart, that do not appear to have much effect until several doses are taken. Then the accumulated effect of the drug may have serious and even dangerous consequences.

A patent medicine is a special mixture of drugs that someone has secured the exclusive patent right to make and sell. The person or company who secured the patent is called the proprietor, or owner, of the medicine. The proprietor usually claims that the medicine has new and valuable curing properties. Frequently such persons are not scientists or physicians.

You will read and hear all your life of certain claims made for patent medicines, cosmetics, and other widely advertised products. Be sure to find out whether such claims are true or false. No one wants to be cheated or fooled, and yet people spend many millions of dollars a year for patent medicines many of which are frauds. Girls and women spend in the neighborhood of two billion dollars a year for cosmetics, most of which could be made up in any drugstore at a fraction of the price charged by their manufacturers.

The principal thing to remember while reading or listening to advertisements that appeal to your natural desire for health or beauty or success is that the product advertised is sold for the purpose of making money. It is not sold because its manufacturer really wants to make people healthy or beautiful or successful, although the advertisements might lead you to think so.

The members of the medical profession do not consider it honorable to make money by selling a useful discovery. No reliable physician would ever keep secret from the other members of his profession any discovery that would relieve suffering or promote health. Real scientists give their discoveries freely to the world, because they want to help

people. Proprietors of patent medicines, on the other hand, claim that they have made wonderful discoveries, although no new medical drug, herb, or substance has ever been found in the analysis of any patent medicine. Such medicines usually are sold for far more than they are worth, and they may also be harmful or, to say the least, useless. Testimonials of certain patent medicines are either frauds or were written because the alcohol or narcotic drug contained in the medicine made the takers believe that they felt better.

Medicines advertised to make fat people thin may contain thyroid extract, a substance that should be taken only under the supervision of a physician. Many medicines sold for colds are useless. Some medicines may relieve a cold, but they do not work for everyone alike. They should be taken only when a doctor prescribes them. The best thing to do for a bad cold is to stay in bed, drink plenty of liquids, and call a doctor if the body temperature rises above normal.

ARE YOU DOING YOUR BEST TO REACH AN INTELLIGENT DECISION CONCERNING THE USE OF ALCOHOLIC BEVERAGES, TOBACCO, AND MEDICINE?

Have you made up your mind to wait until you are twenty-one before deciding whether or not to drink or smoke?

When in doubt about any course of action do you think of the possible consequences?

Are you learning to practice self-control in everything that you do?

Are you using your knowledge of the body and its care to consider carefully the claims made in patent-medicine advertising?

Do you avoid self-medication?

Do you refuse to accept any food, drinks, drugs, or cigarettes offered by strangers?

TRY THESE TESTS

1. Match each word or group of words in the box with the word or group of words in the list below the box that you associate with it. (*Do not write in the book.*)

the nervous system	depressant
anti-narcotic acts	patent medicine
drug addict	marijuana
nicotine	carbon dioxide and ethyl alcohol
morphine	abstainers

the substances remaining in a sugar solution after yeast cells have extracted the oxygen
something that slows down one or more body activities
the part of the body chiefly affected by alcohol
the dried leaves and flowers of the hemp plant
people who never drink alcoholic beverages
the narcotic drug in tobacco smoke
an habitual user of opium or cocaine
a preparation of opium
laws forbidding the unlicensed shipment of habit-forming drugs
a special mixture of drugs that one individual or company has the exclusive right to make and sell

2. Which of the following statements are true and which are false? Reword each false statement so as to make it true. (*Do not write in the book.*)

a. Carbon dioxide is the substance in whisky that causes intoxication.

b. Beer is a stimulant.

c. The alcohol in an alcoholic beverage weakens self-control.

d. A very small amount of alcohol may cause the driver of an automobile to make a fatal error in handling his car.

e. A tired person can do better work after taking a drink of whisky.

f. Alcohol lessens the power of paying attention to work that requires speed and accuracy.

g. A big drink of gin or whisky will ward off pneumonia after a severe chill.

h. Alcohol is no longer used widely as a medicine.

i. People who drink heavily live longer than people who do not drink.

j. The taxes collected on the sale of alcoholic beverages are a good source of government revenue.

k. Young people are more sensitive to tobacco smoke than are adults.

l. Opium or cocaine is an absolute necessity to the addict.

m. Hashish is a narcotic drug found in the coco plant.

n. Many advertised "cold" medicines are of no value.

THINK ABOUT THESE QUESTIONS

1. What is meant by self-control? How does the drinking of beverages containing alcohol affect self-control?

2. What happens to the food value of a fruit juice when it is turned into an alcoholic beverage? Why is it logical to call alcohol a fuel rather than a food?

3. Does the government of a country really profit from the taxes collected for the sale of alcoholic beverages? What are the reasons for your answer?

4. Oliver wishes to be an athlete when he goes to college. Some of his friends smoke, and Oliver is tempted to begin smoking, too. What are some arguments that might influence Oliver in making up his mind whether to smoke or not to smoke?

5. Why is there a difference of opinion regarding the licensed sale of alcoholic beverages and tobacco while there is no difference of opinion regarding the sale of opium, cocaine, and marijuana cigarettes?

6. Why does a person or a company find it profitable to manufacture, advertise, and sell a patent medicine? To what fundamental desires of human nature do patent-medicine advertisements appeal? Why do doctors never prescribe drugs the effects of which on the human body they do not know? Why is it dangerous for people who have not studied medicine to prescribe or to take drugs or mixtures of drugs on their own responsibility?

1. Do the following experiment in order to compare the effect of water on fats and the effect of alcohol on fats. Fill one bottle two-thirds full of water and label it *A*. Fill a second bottle two-thirds full of alcohol and label it *B*. Note that both liquids are alike in appearance. In what ways are they not alike (smell and feeling on hand)? Put an equal amount of a fat (suet, olive oil, lard, or butter) into each bottle, and watch results. Note what effect alcohol has on the fat and what effect water has on the fat. Find out ways in which alcohol is valuable commercially because of its ability to dissolve what water will not dissolve. What is the probable effect of alcohol on the fat-coated nerve cells?

2. Do the following experiment to show the effect of alcohol on water. Pour water into a small bottle until it is half full. Then fill the bottle to the brim with alcohol. Close the opening of the bottle with your finger and shake. Notice what happens. Find out the meaning of the word *dehydrant*. Find out some of the commercial uses of alcohol as a dehydrant. Find out the effect of alcohol as a dehydrant on the moist tissues of the body. Why is a person likely to feel very thirsty after recovering from a drinking spree?

3. As a class activity collect newspaper stories about automobile accidents which took place because a driver or a pedestrian had been drinking. Explain why drinking even a small amount of an alcoholic beverage may increase the liability to accidents on the part of a driver or a pedestrian.

4. As a class activity collect pictures which members of the class think illustrate qualities that a leader in business or in athletics must possess. Label each picture with the name of the quality that stands out, as alertness, skill, speed, courage, sportsmanship, etc. Discuss in class the effect that heavy drinking may have on the dimming of such qualities.

5. Write and act a play in which the hero is a young boy who is tempted to start smoking cigarettes. Create a situation in which the hero is presented with arguments for and against smoking before the age of twenty-one.

6. Have a class committee visit a drugstore and find out what government regulations concerning the sale of narcotic drugs the druggist must obey. After the committee has made its report, discuss in class the following questions: What constitutes the proper use and what constitutes the misuse of drugs of all kinds? Why does it sometimes become necessary to limit by law the freedom of the individual in selling or in buying any product? If the class had the power to make and to enforce laws, would it make any changes in the present methods of advertising?

7. Find out what you can about the hemp plant. In what ways is it useful commercially? Why has it become necessary to limit by law the growing, sale, or possession of this plant? Learn to identify the hemp plant so that you can report its presence to the police if you find it growing in or near a community where it is unlawful to grow it.

8. As a class activity have a trial in which ethyl alcohol or some other narcotic drug or a patent medicine is the defendant. A committee of the class may visit a local court of justice to find out what the procedure should be. This information also may be obtained by interviewing a judge or an attorney or from books and newspapers.

Have a judge, a jury, a prosecuting attorney, an attorney for the defense, witnesses for the defense and for the prosecution, the necessary court officials, and a guard for the defendant. If you have a school newspaper, reporters should be present to write the story of the trial.

In taking testimony from the witnesses the attorneys on both sides should bring out all the arguments for and against the defendant. The judge must then sum up the testimony for the jury, and the jury after considering the facts as brought out by the witnesses will render a verdict of guilty or not guilty. According to the verdict the judge will either dismiss the defendant or pass sentence.

A trial of this kind has been held in many schools. It may be used for a school assembly program, or it may be given before a meeting of a parent-teacher association or a local grange or some other community group.

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

narcotic drug
ethyl alcohol
fermentation
oxidize
stimulant
depressant
perception
abstainer
nonabstainer
stupor
toxic
excessive
drug addict
opium
cocaine
morphine
codeine
heroin
paregoric
coco plant
cacao plant
novocaine
procaine
marijuana
hashish
"reefer"
"loco weed"
"Mary Warner"
self-medication
patent medicine
proprietor (of a patent medicine)
dehydrant

2. Tell the difference between the following words or terms:

stimulant and depressant
abstainer and nonabstainer
opium and cocaine
heroin and novocaine
coco plant and cacao plant
nicotine and hashish
drug addict and patent-medicine proprietor

UNIT VI

Community and Home Cleanliness

As primitive people were great wanderers, they did not need to have village clean-up days. Instead of burying the clamshells and the bones and all the other rubbish that accumulates when people live for any length of time in one place, they simply moved away from it. But when settled community life was well established, the removal of wastes presented problems so great that they were seldom solved satisfactorily until a sense of civic responsibility for community health and decency had been awakened.

The ancient city of Rome made the first great contribution in the field of public sanitation. It had paved streets and sewers for carrying off wastes. It had a street-cleaning department, building regulations, and strict laws governing the purity of food supplies. But after the fall of the Roman Empire hundreds of years were to go by before any city could rival its reputation for beauty and cleanliness.

The great sanitary awakening of modern times began in England at about the middle of the nineteenth century. It was then that two Englishmen, Sir Edwin Chadwick and Sir John Simon, began to work hard for the passage of laws for better sanitary conditions in towns. Inspired by them, the movement began for better water supplies, better housing, and better waste removal. Today we may walk through clean streets in our cities, and the majority of homes in our country have facilities for cleanliness that were lacking in the finest palaces of other days.

DO YOU KNOW

What an incinerator is?

Why body wastes may be a danger unless they are disposed of properly?

What special precaution must be taken in locating privies and cesspools?

How to make every day a clean-up day?

How to plan a clean bright home?

How to wash dishes and make beds properly?

How to sort the laundry?

What is meant by dry cleaning?

Lambert

Modern street-cleaning equipment used in the city of Philadelphia

COMMUNITY CLEANLINESS

In living we cannot help producing wastes. Parts of the food we buy, such as banana and orange skins, eggshells, and bones, are inedible. We purchase some food in cans, bottles, and boxes. These containers must be disposed of, that is, got rid of, somehow. When we burn coal in the stove or furnace, ashes are left over. In no home would there be room for the family if provision were not made for the removal of wastes. Disposing of refuse of all kinds quickly and efficiently is one of the principal ways in which cleanliness and order may be maintained in the homes and streets and parks of a community.

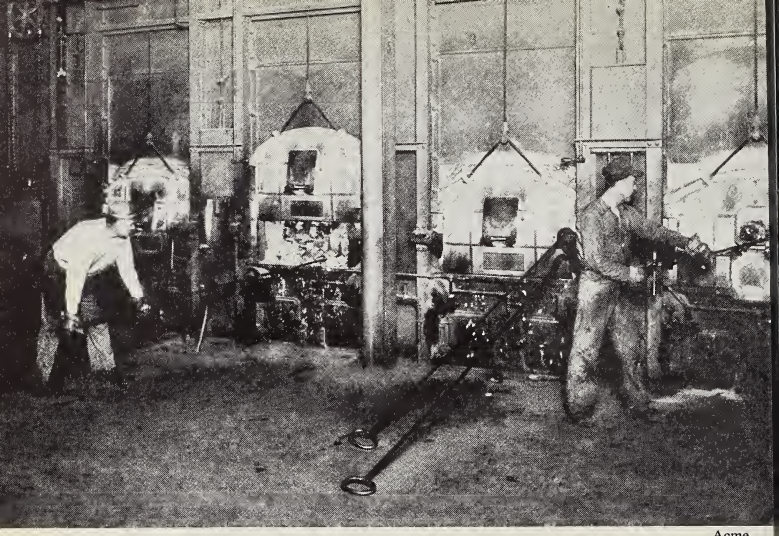
Removal of Solid Wastes from Homes

Solid wastes consist of garbage, ashes, and rubbish of all kinds. The responsibility for removing and disposing of solid wastes from city homes is commonly given to the department of public works or to some engineering department of the city. A street-cleaning department usually takes care of sweeping and washing the streets.

In most cities the solid wastes collected from homes must be separated into two parts. Food wastes, or garbage, must be placed in one metal container and ashes and rubbish in another. The householder is responsible for the good condition of these containers. The garbage-containers should be fitted with tight covers to keep out flies. On certain days householders are expected to place their waste containers at the street curb. City employees collect the waste and cart it away in wagons or trucks.

Ashes usually are dumped in low places in order to raise the level of the land for building purposes. Rubbish also may be dumped on waste land, but town or city refuse dumps are likely to be very unsightly and insanitary. Besides, tin cans, broken dishes and glass, and other receptacles capable of holding rain water make breeding places for mosquitoes. It is a good idea always to punch holes in the bottom of a tin can before throwing it in the trash-container. Some cities located on the seacoast tow rubbish out to sea in scows and dump it. However, this may lead to pollution of the beaches unless the rubbish is towed out so far that it will not be washed back to shore.

The best method of disposing of combustible rubbish is to burn it in a large fireproof receptacle called an incinerator. In many large cities expensive incinerating plants have been built for the burning of rubbish and garbage. People who live in places where there is no public collection



Acme

Burning rubbish and garbage in a public incinerator plant

of solid wastes may purchase small individual incinerators. Care should be taken to place the incinerator in an open space away from buildings and trees. It is important to prevent the escape of blazing scraps of paper or other material that might set roofs, dry grass, trees, or clothing on fire.

Part of the rubbish of a home, such as paper, rags, bottles, and tin cans, may be sold as junk. In many communities the junkman with his horse and wagon and clattering bells is a familiar sight. One large city receives more than a dollar a ton from contractors who are given the privilege of picking over its refuse.

Garbage may be burned or dumped at sea or fed to hogs or placed in trenches and covered with earth. Some cities have plants in which the garbage is treated so that the grease and fertilizing material it contains may be extracted before the useless material is destroyed.

Disposing of Body Wastes

From a health standpoint the disposal of body wastes makes a much more important problem than does the disposing of garbage and rubbish. Body wastes are a danger because they may contain the germs of typhoid fever, dysentery, and other intestinal diseases. In warm climates, such as the southern part of the United States, body wastes also may contain hookworm eggs. When the hookworms hatch from the eggs, they may enter the body of a barefoot person through the skin of the feet. The two chief ways of preventing the spread of hookworm disease are wearing shoes and disposing of body wastes in a sanitary manner.

In rural districts and small villages where the houses are not supplied with running water for diluting body wastes and flushing them into drains, the outhouse, or privy, is in use for the disposal of body wastes. The privy is a small building erected over a pit dug in the ground. When the pit is nearly full the privy house is moved to a new pit and the old one is covered over. The privy house may also be placed over a tank which can be removed and emptied when necessary. Some country homes may have chemical closets. This kind of closet has a watertight tank, and a strong chemical preparation is used to dissolve and disinfect the wastes and to destroy offensive odors. The tank must be emptied from time to time.

Whatever may be the means of disposing of body wastes in places where there is no sewerage system, the wastes must be protected from flies. Flies may spread the germs of intestinal disease by crawling first over infected body wastes and then over food about to be eaten. A privy house must be screened and provided with a tight self-closing door. The seat covers should be weighted so that they close automatically.

Country homes that have running water but are not connected with a public sewerage system may have flush toilets that discharge into a large underground pit called a cesspool. In building privies or cesspools the greatest care must be taken not to locate them where they may infect the water supply of the home. Privies and cesspools should be located below the source of the water supply and one hundred or more feet away from it.

The ideal way of getting rid of body wastes is to have them carried away by a system of public sewers located below the streets. Most towns and cities now have public sewerage systems. Usually the sewers empty into a large body of water, such as a lake, a river, or the ocean. The material as it comes from the sewers is a grayish liquid which is mostly water. Its quantity is enormous. The sewers of New York City, for example, pour into the waters surrounding the city an average of five hundred million gallons of sewage a day. Often it is necessary to treat the sewage in order to prevent offensive odors and the infection of bathing beaches, shellfish beds, or sources of water supply.

Personal Responsibility for Community Cleanliness

To have a clean, beautiful community everyone must help. In most cities littering the streets is against the law; but it is a law difficult to enforce unless each citizen feels personally responsible for keeping his street and his neighborhood free of rubbish and garbage. In cities there are usually rubbish containers at street corners and in parks for the disposal of paper, fruit skins, and other trash. While on a hike or a picnic in the country, one should bury or burn rubbish and waste food or else carry them to a place where they may be disposed of properly.

Chicago Association of Commerce

Clean-up day

Many communities which do not have street-cleaning departments have town or village clean-up days or weeks. These usually are held in the spring. Squads of citizens are organized to clean the streets of paper, tin cans, and other rubbish. Each citizen is made responsible for beautifying his own property. Trees and shrubs are planted, houses and sheds given a coat of paint, and community eyesores, such as rubbish dumps, are removed or concealed from view with screens of shrubbery or trailing vines. The setting aside of a day or a week for cleaning up and beautifying a community is a good way to secure publicity for the idea of good municipal housekeeping and to arouse a feeling of pride in the appearance of a community. A much better

plan is to make every day a clean-up day. If we clean as we go, we shall not have in our homes and communities places that are offensive to the eyes and nose and dangerous to health.

HOME CLEANLINESS

Just as a clean beautiful community shows people that good citizens live there, so a clean comfortable home tells strangers and guests that the people who live in it are good homemakers. For most people it is much easier than it used to be to have a clean body, clean clothes, and a clean home. Until the development of modern water supplies all the water for washing and drinking had to be carried into the home from a spring or a well. Today most homes in cities and towns may get water with no more effort than is required to turn a tap. But there are still places in rural districts where all the water must be carried into the home. Even in some cities there are apartment houses in which running water is not supplied to individual apartments, and water must be carried from a tap in the hall or basement. Often heavy pails of water must be carried up several flights of stairs. Boys and girls who keep themselves and their homes clean in the face of difficulties of this kind may well be proud of themselves. For all other people there is no excuse for not being clean.

Nowadays the cheapness of soap and other cleansing agents and the invention of all sorts of labor-saving devices have lightened the labor of keeping a home clean. Added to this is the fact that fashions in floor coverings and draperies have changed, and modern homes are planned with an eye to light, ventilation, and cleaning facility.

Planning a Clean Home

The secret of having a clean bright home is the efficient use of equipment and the systematic use of time. The homemaker is the general of a little army consisting of all the members of the family. The weapons of this army are soap and water and the various implements of cleanliness. The enemies to be fought are dirt and disorder; and victory over these enemies means a home that is shining clean.

A good general first maps out a plan of campaign. This plan will be different for each home, because in each household there are cleaning problems and a family group different from those to be found in any other home. The first thing to do is to make a list of all the cleaning and tidying duties that must be done every day. It is a good idea to figure out the amount of time it takes to do each task of this kind. Then the different jobs may be divided up among various members of the household.

Even small children may have their share in the daily cleaning program. They can learn to bathe and wash themselves, to keep their bureau drawers tidy and find their own clean clothes, to air their beds, to brush crumbs from the table, to carry dishes to the kitchen, to pick up their playthings, to hang up their clothes, and to keep from tracking dirt into the house.

Older boys and girls should have definite duties that will greatly lighten the task of the chief homemaker and yet give them plenty of time

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How is this boy showing that he is a good citizen in the home?

Keystone

for play and study. As a matter of course they should clean up after themselves. Washing out the tub should be done right after taking a bath. Any litter made in the pursuit of a hobby should be cleared away. Assuming complete responsibility for keeping one's own room tidy and looking after one's own belongings is one way of being a good citizen in the home.

In addition to duties of this kind there are other duties that are part of the daily routine of life in the home. Washing dishes, cleaning, and making beds are duties of this kind. In many homes the older boys and girls take turns in performing these tasks.

In some families the younger members help to plan a

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A dishwashing machine is one of the modern labor-saving devices that makes housework easier than it used to be

schedule which shows the home duties of each one during the coming week. This schedule is posted where everyone can consult it, so that there will be no question as to whose turn it is to wipe the dishes after supper on Wednesday, for example, or to set the table for breakfast on Friday.

Besides daily cleaning duties there are tasks that come two or three times a week, once a week, and once or twice a month. These include washing and ironing, unless the laundry is sent out, the thorough cleaning of rooms, washing windows, and cleaning silver. Tasks of this kind should be divided up among different days of the week. If the homemaker will make a study of the time needed to perform different household tasks, she will perhaps be able to think of many short cuts to save time. When she has listed and timed all the cleaning tasks, her next step is to make a plan that will give each day a fair share of the work.

Of course no plan should be so rigid that it cannot be adjusted to holidays and unexpected guests and to the emergencies that happen in nearly every household. The plan should be comfortable to live by and should never become more important than the people who follow it. Probably you have all heard or read of housewives whose notions of cleanliness are so rigid that life is made miserable for the family and the guests. Good housekeeping, like good children, should be seen but not heard. If each member of the family remembers to do his or her share in the plan for keeping a home bright and clean, there will be no need for unpleasantness.

Cleaning Duties

Dishwashing is much easier if the dishes are first well scraped and then rinsed with running water. The dishes should be put in hot soapsuds and cleansed with a dish

mop. Usually the glasses and silver are washed first. Boiling water should be poured over the dishes to scald them after washing. They should then be polished with a clean dry towel.

The garbage pail should be washed out often with soap and hot water. A long-handled brush makes it easier to get the pail thoroughly clean. After the pail has been washed, it should be placed in the sun and left there until it is thoroughly dry. If the pail is lined with several thicknesses of newspaper before any garbage is put in, it will be easier to clean. The pail should have a tight-fitting cover in order to keep out flies.

A strainer should be placed over the drain-pipe outlet in the sink to keep food from clogging the pipe. After the sink has been used, grease and dirt spots should be scrubbed off with the help of some good cleansing agent. A little ammonia and water used occasionally in washing the sink will keep it sweet-smelling and help to remove stains. Faucets and other metal fixtures may be kept clean with soap and water and an occasional polishing with a clean dry cloth.

Enameled stoves are easy to keep clean if spills are wiped off at once. If a homemaker has an electric stove, she should make sure that the burners are all turned off before wiping it with a damp cloth. Some people have received bad electric shocks by forgetting to turn off the electricity before using a damp cloth to wipe up food that has spilled on an electric stove. The parts of a stove that are not enameled may be kept from rusting by applying stove oil and polishing until dry. The fire in a coal range must be allowed to go out occasionally so that the range may be cleaned thoroughly both inside and out and inspected for safety.

If the basin and bathtub are always washed out immediately after use, there will be no chance for them to become spotted or stained. A brush hung near the tub will be a

Westinghouse Electric and Manufacturing Company

Any germs that might have been left on these glasses after washing are killed by ultraviolet-light rays coming from the lamp set under the roof of the sterilizer

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reminder to wash out the tub. It takes plenty of soap or a mild cleansing agent to remove the unmannerly "bathtub ring" which advertises the water level of the last bath taken. The toilet bowl should be flushed immediately after use. It also should be given a good cleaning every week with a special long-handled brush. Some people flush the bowl occasionally with a mild disinfectant.

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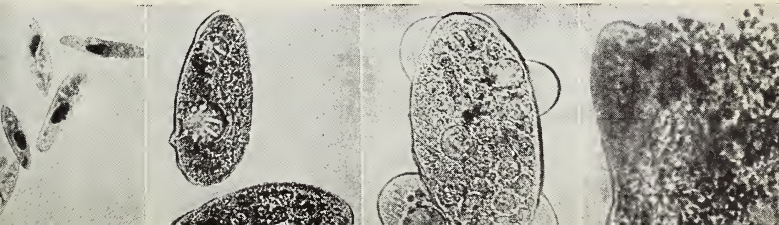
The effect of ultraviolet-light rays on one-celled forms of life. The first picture at the left shows one-celled animals called paramecia. The remaining pictures show the stages in the death of these little creatures after they have been exposed to ultraviolet-light rays



Most families keep their towels and washcloths in the bathroom. Each individual should have his own towel hook or bar. Sometimes a certain color is used to indicate the ownership of a towel and washcloth. Regular days should be appointed for replacing soiled towels with clean ones. Washcloths should be hung where they can dry, in order to keep them sweet-smelling, and they should be changed frequently.

The surface dust and dirt from rugs should be removed every day with a vacuum cleaner or carpet sweeper. This prevents grime from becoming deeply ground into the rug and preserves its texture. In buying a vacuum cleaner one should take time to find out how it works and how to take proper care of it.

In modern homes the floor boards and woodwork usually are painted, waxed, or varnished. Wood treated in this way is easier to keep clean. Even hardwood is porous and absorbs dirt unless the surface is protected. Kitchen floors may be covered with linoleum, and the bathroom floor with tiles. Floors and woodwork should be dusted every day. Occasionally they should be washed with a cloth or mop wrung out of warm soapsuds and then wiped off with a clean cloth.

Bedmaking and Care of Bedding

As sheets and pillowcases touch the skin, they absorb perspiration and oil from the body. They should be changed once or twice a week. The minimum requirement is the traditional routine of one clean sheet for every bed each week. The clean sheet is put on as the top sheet and the former top sheet is used as the bottom sheet.

As blankets do not touch the skin, they may be kept clean by washing them once or twice a year with lukewarm

water and soap flakes. Pads placed over the mattress should be washed frequently. Mattresses may be kept free from dust by brushing or by cleaning with a vacuum cleaner. Mattresses should be aired and turned frequently.

The bedstead should be wiped off with a clean damp cloth about once a week. The springs, unless they are box springs, may be dusted with a small brush and then wiped with a damp cloth.

Sleep is much more likely to be restful if the bed linen is crisp and clean and the bed is well made. After getting out of bed pull off the bedclothes so that the bed will air. In making the bed put the pad on the mattress and spread over it the lower sheet with the "wrong side" next to the mattress; tuck the sheet in well at the top, pull it down firmly, and tuck in both sides. Place the upper sheet with the wide hem at the top and the "right side" touching the lower sheet. Then fold it in under the bottom of the mattress, lifting the mattress to do so, and tuck in the sides. Place the blankets over the upper sheet leaving a space of ten

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Learning to make a bed in homemaking class

inches between the top border of the blankets and the wide hem of the upper sheet. Tuck in the bottom and sides of the blankets and turn the top of the upper sheet over the top edge of the blankets. Then put on the counterpane, or spread, and place the pillows as desired.

Laundering Clothes

The first step in laundering clothes is to examine each article carefully for stains and rips or tears. Stains should be removed before laundering, as washing "sets" most stains. Rips and tears should be mended to avoid further damage. Pins and sharp ornaments that might scratch the hands should be removed.

Before starting to do the laundry the clothes should be sorted into piles of white cottons and linens, colored cottons and linens, and fine fabrics, such as woolens and silks.

All white cottons and linens should be soaked in soapy water for from one to two hours before washing, as this helps to loosen the dirt. Handkerchiefs should be boiled.

White and colored clothes should not be put in the tub or washer at the same time. If it seems likely that the color in a new garment will run, the garment should be washed separately.

Silk and wool garments must be washed in lukewarm water, and soap flakes should be used. They must not be rubbed but cleansed by squeezing the water in and out of the fabric. Clothes made of cotton and linen may be rubbed without injuring the texture.

All clothes should be rinsed in several clear waters to remove the soap. Most people do not use enough rinsing waters. Clothes should be hung outdoors to dry in the sunshine whenever possible. Each piece should be shaken out before it is hung on the line.

The Danger of Dry Cleaning in the Home

By dry cleaning is meant the cleaning of clothes, rugs, furniture, or floors with a fluid that evaporates rapidly. Most fluids of this kind are highly inflammable or explosive. Gasoline, which is sometimes used as a cleaning fluid, gives off a vapor many times more explosive than dynamite. Even a small friction spark will cause it to explode violently.

A woman was wiping up her polished floors with gasoline when she noticed a small blue flame on the floor. The next instant there was a tremendous explosion. The woman was badly burned and terribly disfigured for life. The friction caused by the rubbing of the gasoline-soaked cloth on the floor was the cause of this accident.

Gasoline has no place in the home under any circumstances. For cleaning small spots from clothes, rugs, or furniture, a small quantity of cleaning fluid which is guaranteed to be *nonexplosive* and *noninflammable* should be secured. Even then the cleaning should be done out of doors. No cleaning fluid is safe to use in large quantities, because the fumes may be harmful even if there is no danger of fire or explosion. It is more economical, in addition to being much safer, to have all dry-cleaning jobs done at a regular dry-cleaning establishment.

ARE YOU DOING YOUR BEST TO HELP IN KEEPING YOUR COMMUNITY AND YOUR HOME CLEAN AND ORDERLY?

Do you help to keep your garbage pail clean and tightly covered?

When you are made responsible for removing ashes from the stove, furnace, or fireplace, do you place the ashes in a metal container?

When you are given the job of burning garbage or rubbish, do you do a neat, thorough job and take precautions against the spread of fire?

If your home is not connected with a public sewerage system, do you take the necessary precautions for keeping flies away from body wastes?

If you live in a place where hookworm is prevalent, are you careful not to walk on the ground with bare feet?

Are you careful not to litter city streets and country highways with paper, fruit skins, and other waste material?

Do you clean up after yourself at home?

Do you do cheerfully the home-cleaning tasks assigned to you?

Do you take so much pride in doing things well that you are learning the proper methods of doing various home-cleaning tasks?

Healthy homes are happy places;
Happy homes make smiling faces

KODACHROME BY STEVEN A. COONS

TRY THESE TESTS

1. Match each word, term, or name in the box with the word or group of words in the list below the box that you connect with it. (*Do not write in the book.*)

Sir Edwin Chadwick	hookworm disease	ancient Rome
body wastes	New York City	garbage
gasoline vapor	typhoid fever	
incinerator	Sir John Simon	

the first city to make a contribution in the field of public sanitation
the fathers of the great sanitary awakening of modern times
food wastes
a receptacle for the burning of rubbish and garbage
an intestinal disease
a city which averages five hundred million gallons of sewage a day
sewage
a disease spread by going barefoot
an explosive

2. Which of the following statements are true and which are false? Reword each false statement so as to make it true. (*Do not write in the book.*)

a. It is important to dispose of body wastes in a sanitary manner because they may contain the germs of communicable diseases.

b. Privies and cesspools should be located above the source of drinking-water supplies.

c. It is easier to have a community clean-up day twice a year than to take the trouble always to deposit all litter in containers provided for the purpose.

d. The secret of having a clean bright home depends on the efficient use of cleaning equipment and the systematic use of time.

e. Little children cannot be taught habits of cleanliness.

f. Sharing the common duties of a home gives each member of the family more time for leisure and recreation.

g. Dishes should be washed in hot soapsuds and rinsed with scalding water.

h. There is no reason why one person should not use another's towel if it looks clean.

i. Each bed should have at least one clean sheet a week.

j. Silk stockings should be washed with hot water and a strong soap in order to get all the dirt out.

k. No dry-cleaning fluid of any description should be used indoors.

THINK ABOUT THESE QUESTIONS

1. What is the use of trying to make a city clean and beautiful? What is your community doing to beautify the streets, highways, and parks? What are you doing to help? In what ways does the appearance of your community give you pleasure? How do you think its appearance may be improved?

2. What are some of the ways in which the careless disposal of body wastes may lead to the spread of communicable diseases? For each method of spread by this means that you remember, tell how it might be prevented.

3. What are some of the ways in which knowing how to do things properly helps to lighten housework?

4. What effect do clean attractive home surroundings have on the members of a family?

DO THESE THINGS

1. Select one section of your community and make notes for one week on its appearance. Note conditions you would like to see improved and tell why. Note all the things that please you and tell why they are pleasing. Make a plan telling how you would gain the interest of the people of a community in improving the sanitary condition and the appearance of the streets.

2. Study the life history of the housefly. If possible raise flies through successive stages of their development. Find out what makes a good breeding place for flies. Find out why there is a good scientific basis for objecting to flies' walking over bread, meat, and other foods. As a class activity make a census of fly-breeding places in the community. Discuss ways in which the class may help to remove these places. Discuss what each member of the class may do to discourage flies from entering his or her home and from breeding in or near the home.

3. Compare the home life of today with that of colonial times in regard to various housekeeping procedures. Find out what cleaning materials and what labor-saving appliances we now have that were unknown or very rare in those days. Discuss in class what effect the lightening of necessary housework has on family life.

4. Make a family time schedule for your own home with the object of finding out whether your mother may be given extra hours of leisure by distributing various household cleaning tasks among different members of the family. If your mother is willing, find out whether the plan will work by performing the tasks you have assigned to yourself and by gaining the co-operation of the rest of the family.

5. Work out a plan for the quickest way possible of washing the dishes in your home and putting the kitchen in order afterward. On a floor plan of the kitchen show the route you would take in order to take as few steps as possible. Would it be possible, by a rearrangement of the kitchen furniture, to reduce the time and the number of steps now needed for dishwashing?

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

public sanitation	disposal	dry cleaning
public sewerage system	privy	inflammable
incinerator	cesspool	noninflammable
dispose	paramecia	

2. Complete the following paragraph by filling in the missing words. (*Do not write in the book.*)

The students in the eighth-grade class of Hillside School went on a picnic. They found the picnic ground in such an insanitary condition that in the interest of __?__ __?__ they decided to __?__ of all the trash lying about before eating lunch. The girls built a fire in the __?__ on the picnic grounds and burned all the __?__ rubbish. The boys dug holes and buried all the __?__ material scattered about.

UNIT VII

Ways of Fighting Communicable Disease

All sorts of reasons, which seem strange to us now, were once given to explain the spread of communicable diseases such as smallpox, diphtheria, yellow fever, and the bubonic plague, commonly known as the Black Death. Most people thought that such diseases were caused by bad air and that they spread in the direction in which the wind blew. Some thought that the position of the stars in the sky had something to do with the spread of disease. Still others believed that the body poisoned itself.

Then about seventy years ago the great French scientist Louis Pasteur proved that communicable diseases and wound infections are caused by living germs which enter the body from the outside. At last doctors and public health officials knew what it was they had to fight. It was a great relief to know that communicable diseases are not caused by enemies which cannot be controlled, such as poisonous air or "evil stars," but rather by foes which can be fought and conquered.

In the comparatively short period during which scientists have known the secret of infection many things have been learned about harmful germs, the ways in which they are spread, and how the body defends itself against them. This knowledge is free for all of us to use in protecting ourselves and those we love from unnecessary illness.

DO YOU KNOW

Which family of germs is the most numerous?

What a filterable virus is?

Why it has been said that "the army with the fewest lice usually wins"?

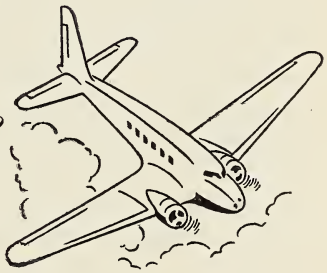
What famous disease is spread by the rat flea?

How malaria got its name?

How to get rid of mosquitoes?

What made possible the building of the Panama Canal?

What part an airplane may play in spreading yellow fever?



What is meant by immunity?

Why a person who has had measles usually does not catch it a second time?

Why vaccination protects against smallpox?

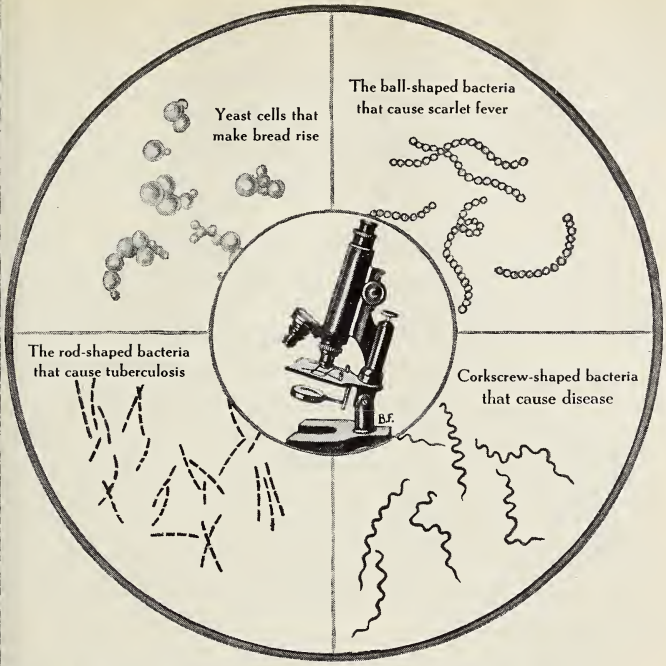
What the Schick test is?

CLASSIFYING HARMFUL MICROORGANISMS

A child with rickets, an old man suffering from heart disease, a person wheezing with asthma, a sailor sick with scurvy cannot possibly give these diseases to others. Therefore we classify as noncommunicable all diseases such as rickets, heart disease, asthma, and scurvy, which cannot be transferred from one person to another.

On the other hand, there are certain diseases, such as measles, whooping cough, tuberculosis, smallpox, and diphtheria, which are caused by living germs. These germs may be carried in various ways from the sick to the well. Therefore we class diseases of this kind as communicable, that is, capable of being transferred from one person to another. Strictly speaking, however, we do not say that a disease like scarlet fever is communicable, but that the germ which causes scarlet fever is communicable. We know, too, that each communicable disease is caused by a particular kind of germ which can cause that disease alone and no other. That is, the germ which causes one communicable disease, such as scarlet fever, cannot cause another communicable disease, such as diphtheria, any more than an acorn can grow into lettuce instead of an oak tree.

Scientists usually speak of germs as microorganisms. An organism is any form of life no matter how simple. A microorganism is an organism so small that it can be seen only by using a microscope. It is very difficult to divide microorganisms into definite classes because several are even simpler in form than are one-celled plants, and others are like one-celled plants in some ways and like one-celled animals in other ways. But usually microorganisms, or germs, are classified as the *bacteria* (singular, *bacterium*), the lowest forms of plant life known, and the *protozoa* (singular, *protozoon*), one-celled animals.


Yeast cells that make bread rise
The ball-shaped bacteria that cause scarlet fever
The rod-shaped bacteria that cause tuberculosis
Corkscrew-shaped bacteria that cause disease
B.F.

What is the scientific name for each kind of disease-causing bacteria shown in this picture? How are you informed that the organisms shown are microorganisms?

Of all the microorganisms, the bacteria are by far the most numerous. The bacteria fall into three main classes, or families, according to their form. First, there are the *cocci* (singular, *coccus*). The bacteria in this family are shaped like spheres. One kind of coccus, called the *pneumococcus*, causes pneumonia. Other divisions of the coccus family are the *streptococci* and the *staphylococci*. One kind of streptococcus causes blood poisoning; another kind causes scarlet fever. Boils and infected pimples usually are caused by staphylococci.

The second family of bacteria, the *bacilli* (singular, *bacillus*), are shaped like rods, which may be long or short. Among the most familiar diseases caused by bacilli are diphtheria, typhoid fever, and tuberculosis.

The third family of bacteria are known as the *spirilla* (singular, *spirillum*). The spirilla are spiral or curved in form.

The diseases which are the most interesting to medical scientists at the present time are the diseases caused by viruses, because so much remains to be discovered about them. The viruses are called filterable because they pass through the finest filters made. If a clear soup containing bacteria is poured into a laboratory filter, the liquid will pass through the pores of the filter, but the bacteria will be caught and held, just as the rice in a clear soup will be caught and held by the meshes of a sieve through which the soup is poured. But if a clear soup containing a virus is poured into a filter with pores so fine that it takes many days for pure water to pass through, the virus will pass through the filter with the liquid.

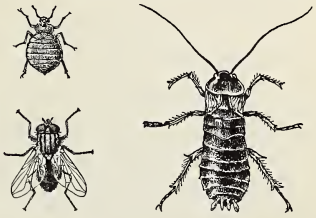
The diseases caused by viruses include infections of the greatest public-health importance. Among the diseases that are definitely known to be caused by filterable viruses are smallpox, measles, mumps, epidemic influenza, a variety of common cold, infantile paralysis, rabies, yellow fever, and certain kinds of warts.

No one has yet succeeded in making a virus grow and multiply except in the presence of living cells. Bacteria can thrive and multiply in the body and also outside the body on any sort of food that agrees with them. Viruses, on the other hand, are inactive when not in contact with living cells. When placed in contact with living cells a virus becomes alive. For this reason it looks as if the viruses stand somewhere between living and nonliving things.

Watch the papers for news about the progress made in the study of viruses. This news is far more important than the news of wars and rumors of wars, because knowledge which will help us fight the virus diseases will save more lives than are lost on fields of battle.

INSECT CARRIERS OF DISEASE

In order to make a person sick, harmful germs must be able to live and multiply after they have entered the body. They must enter in large enough numbers to cause disease. They must also enter through a gateway which leads to the place in the body where they find the most favorable living conditions. Most communicable diseases are caused by microorganisms which reach locations where they can live and multiply by entering the body through the mouth or nose.



Some insect carriers of disease. Identify each one

But there are some organisms, such as the protozoa of malaria, which must enter the blood stream directly in order to make a person sick. This is why the bites of some insects are dangerous. Some insects act as mechanical carriers of germs. This means that they carry germs from place to place on their bodies. Flies, cockroaches, lice, fleas, and bedbugs often act as mechanical carriers. The last three also may become infected through biting a diseased animal or human being and then, in biting another person, may put the living germs into that person's blood.

Getting Rid of Bedbugs and Cockroaches

The bedbug can be detected by its flat body, which enables it to hide in the narrowest cracks of beds, in mattresses, under wallpaper, and in furniture. Bedbugs are blood-sucking insects. Their bites leave lumps on the skin which itch and cause the victim great discomfort. The bloodthirsty bedbug quickly advertises its presence in a bed by its bites. It is not so quickly got rid of. These unpleasant vermin may be killed with kerosene. There are other insect-exterminators on the market for destroying bedbugs. If a bed is infested with bedbugs it is best to carry it outdoors, take it apart, and douse every part with kerosene or a fluid insect-exterminator. The mattress and pillows also should be sprayed with the exterminator. It may be necessary to repeat this treatment two or three times, as the tiny bedbug eggs may not all be destroyed the first time. In most cities there are companies that make a business of exterminating bedbugs and other insect vermin.

Cockroaches are insects that thrive in filth. They are likely to be found in kitchens that are not kept clean. Roaches feed on almost any dead organic matter. They soil everything with which they come in contact. People have been made seriously ill by food which has been soiled by cockroaches. These insects lurk in unclean damp places. To get rid of them it may be necessary to dust cracks, holes, and damp places in the kitchen and cellar with powdered borax or a chemical called sodium fluoride.

Lice and Typhus Fever

Dr. Hans Zinsser, a famous scientist, says that the louse has been a greater conqueror than Napoleon or Caesar and that the army with the fewest lice usually wins. The reason

for this statement is that the body louse is a carrier of the germ of a disease called typhus fever. It is estimated that more than two million Russians died of this dreadful disease during the World War. In 1917, three years after the war started, a French doctor named Charles Nicolle proved that the body louse carries the germ of typhus fever. He received the Nobel prize for medicine in 1928 for his famous discovery.

When lice feed on the blood of a person sick with typhus fever, they suck up some of the germs with the blood. If

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During the World War, soldiers got rid of body lice by having their bedding and their clothes sterilized

these lice are transferred to another person, they pass on the germs by their bite. When the news of Dr. Nicolle's discovery became known, army doctors were kept busy freeing the soldiers' clothing and bodies of lice.

Lice thrive best among people who live in crowded conditions and who do not have a chance to bathe and to put on fresh clothes frequently. Very successful warfare is being carried on against typhus fever in countries such as Poland and Russia, where it was once prevalent, by the plentiful use of soap and water. A clean body and frequent changes of underclothing are the best guarantee against germ-carrying lice.

The head louse, or *Pediculus*, is the member of the lice family most often encountered in our country. People who have head lice are said to have pediculosis. Head lice may be passed from one person to another on combs, hair brushes, coat collars, and hats. Other diseases that affect the scalp also may be transmitted in these ways. To keep the scalp and hair healthy, brush your hair vigorously every day and shampoo it once a week. To avoid pediculosis and other communicable diseases of the scalp, wear only your own hat and coat, use only your own brush and comb, and always hang your hat and coat on a separate hook.

Bubonic Plague and the Rat Flea

The bubonic plague, or Black Death, may properly be called "the King of Terrors." At one time it caused the death of one fourth of the population of the earth (sixty million human beings). It appeared in Europe in the year 1348 and broke out again and again in later centuries. The Black Death brought panic and confusion in its train. Parents, children, and lifelong friends left one another to die, and driven by terror sought only to save themselves.

Multitudes flying from London by water in boats & barges.
Flying by land.
Burying the dead with a bell before them.
Searchers.
Carts full of dead to bury.

From the Pepys Album. Courtesy of Magdalene College, Cambridge

Scenes in London, England, during an epidemic of the Black Death

In the year 1894 two scientists working independently, one a Japanese and the other a Swiss, discovered the bubonic-plague bacillus. The Japanese was S. Kitazato and the Swiss was A. Yersin, one of Pasteur's most brilliant pupils. A few years later other scientists were able to prove that the rat flea by its bite spreads bubonic plague from rat to rat and from rat to man. The rat flea, as well as the body louse, is also a carrier of typhus fever.

Of all animals living at the expense of man the rat is not only the least useful but also is perhaps one of the most dangerous and the most expensive. It is estimated that in any community the rat population equals the human population. As one rat eats nearly two dollars' worth of food a year, rats cost the United States and Canada millions of dollars annually just for what they eat. Besides, rats pollute and make unfit for eating much more food than they themselves consume, and they destroy all kinds of articles and merchandise. But the worst charge against them is that they are moving breeding places for the fleas that spread bubonic plague and typhus fever and that their intestinal discharges may contain the germs of certain communicable diseases.

Colonies of rats exist in buildings and elsewhere because of conditions which enable them to get food, hide, build their nests, and breed. If these conditions are changed by putting up buildings into which rats cannot gnaw their way or by repair work in old buildings which will make it impossible for rats to get into their harborages and build nests, we may hope some day to keep mankind from coming into close contact with rats. The frequent inspection of a house for signs of rat life, the prompt removal of rubbish, and keeping all food, including garbage, in ratproof containers are other ways in which we may win the war against rats.

Malaria and the Anopheles Mosquito

Malaria has an ancient and dishonorable record. Some scientists believe that the downfall of the great civilizations of ancient Greece and ancient Rome was due in part to this disease. Today malaria occurs in a great belt around the world covering the tropics and the subtropics and extending some distance north and south of these regions.

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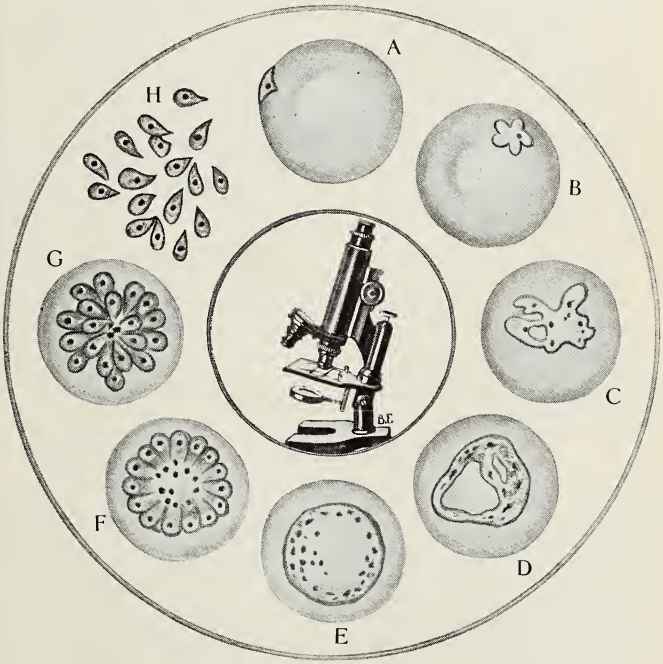
Figure A shows a protozoon of malaria entering a red blood corpuscle. Figures B to H show how the one-celled protozoon divides into many cells, which finally burst out of the corpuscle into the blood stream. When this happens the malaria patient has an attack of chills and fever



In the year 1880 a French army surgeon named Alphonse Laveran discovered the protozoa of malaria in the blood of malaria patients. These organisms attack and destroy red blood corpuscles. Quinine is used successfully in treating a person sick with malaria because it kills the protozoa in the blood stream.

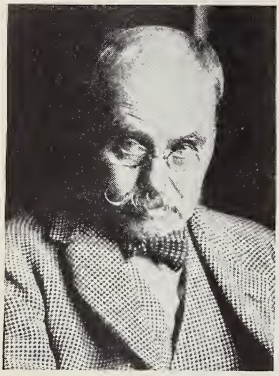
It had long been known that malaria is especially prevalent in low-lying swampy regions. Several wise observers had considered the idea that the mosquitoes so numerous in swampy regions might have something to do with malaria. Then, between the years 1895 and 1898, Ronald Ross, an English army surgeon in India, found in the body of a mosquito an organism that he thought might possibly be the protozoon of human malaria. Birds can be given malaria, and so Ross experimented with birds. Finally, after months of painstaking study, Ross was able to prove that bird malaria is actually transmitted by mosquitoes. Ross received the Nobel prize for medicine in 1902 for his work on malaria. In 1898 two Italian scientists, Grassi and Bignami, proved that certain mosquitoes transmit human malaria.

What these scientists had discovered was this: If a female mosquito belonging to the genus *Anopheles* bites a person who has malaria, the protozoa which cause the disease are sucked out with the blood and reproduce in the body of the mosquito. They pass from the mosquito's stomach to its salivary glands and after several weeks can be transmitted to the next person bitten by the insect.

The female anopheles mosquito lays her eggs in stagnant water. The eggs hatch into larvae, or wrigglers. After a few days the wriggler changes into a pupa, or tumbler. After thirty-six hours or more it is again changed and emerges from its stagnant water home as a perfect winged insect.

Find in this picture a foe the Romans could not conquer. What is its name

The way to get rid of malaria is to get rid of anopheles mosquitoes. People in malaria districts can protect their homes by placing tight-fitting screens on all doors and windows. But the best way to control malaria is to destroy the breeding places of malaria-bearing mosquitoes. In many communities it has been possible to drain swamps and pools and then to fill them up with gravel and earth. Where it is impossible to get rid of places where stagnant water accumulates, the surface of the water may be sprayed with light fuel oil. The thin layer of oil on the water cuts off the air supply of the wrigglers and they suffocate. Spraying pools with powdered Paris green is another way of killing the wrigglers. The breeding of mosquitoes in ponds may be controlled by stocking the ponds with small fish that eat the wrigglers. As mosquitoes will breed in any place where water collects, such as tin cans filled with rain water or barrels set under gutter leaders to catch rain water, it is important to remove or to screen such breeding places.



Sir Ronald Ross.
What great discovery did he make?

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Yellow Fever and Aëdes Aegypti

For hundreds of years yellow fever, or "Yellow Jack," was the terror of tropical and subtropical countries. It even extended as far north as Boston, Massachusetts, and in the course of two hundred and eight years there were ninety-five terrible epidemics of yellow fever in the United States.

Walter Reed and a brave band of scientists and army volunteers were able to prove that yellow fever is carried by a certain kind of mosquito. Human beings were used for experiment because at that time yellow fever was supposed to affect human beings only. During the experiments, which took place in Cuba in 1900–1901, Dr. Jesse W. Lazear died of yellow fever, and out of thirteen others who had deliberately allowed themselves to be bitten by infected mosquitoes, ten developed the disease. These experiments proved beyond the shadow of a doubt that the female mosquito *Aëdes aegypti* is a carrier of yellow fever. The mosquito must bite a yellow-fever patient in the first three days of illness and then at least twelve days must go by before it can pass the disease on to another person.

Making war on mosquitoes by spraying the marshes where they breed

Wide World

A scene from *Yellow Jack*. Courtesy of Metro-Goldwyn-Mayer Pictures

Heroes in the war against disease.
Walter Reed at the bedside of Jesse W. Lazear

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Campaigns against this mosquito were very successful in getting rid of yellow fever in the places where it had once been a major cause of death. By the end of 1901, Havana, Cuba, which had been a hotbed of the disease for centuries, was completely freed of yellow fever. A few years later, the brilliant work of General Gorgas in ridding the Canal Zone of yellow-fever mosquitoes made possible the building of the Panama Canal.

Then years later, in the interiors of Africa and South America, cases of yellow fever were discovered in places where no *Aëdes aegypti* are found. These centers of infection are a constant danger to the rest of the world. Every effort is being made by scientists of the International Health Division of the Rockefeller Foundation to find out more about the disease and what carriers besides *Aëdes aegypti*

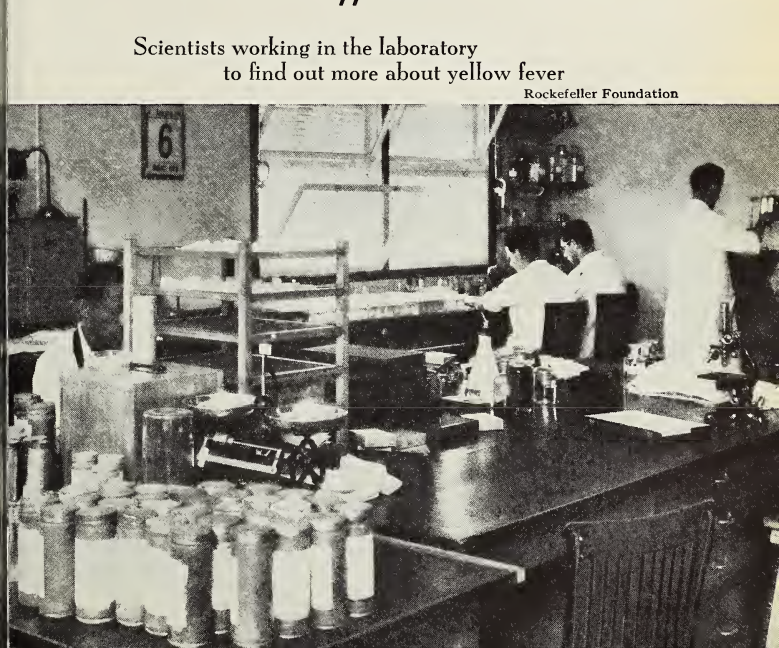
are responsible for its spread. Six doctors while studying the disease in West Africa lost their lives.

In 1927 it was found that a certain kind of monkey could be given yellow fever. By using monkeys for experiment scientists were able to prove that the cause of yellow fever is a filterable virus. In 1931 a vaccine was prepared for protecting human beings against yellow fever. Since then no more brave men have lost their lives while studying the disease.

In efforts to control yellow fever one of the chief dangers to be guarded against is the spread of the disease by airplane travel. A person in an area where yellow fever is prevalent may become infected with the disease without knowing it and reach another area by airplane before the disease has a chance to develop. Infected mosquitoes also may be carried in airplanes. In order to keep yellow fever

Scientists working in the laboratory
to find out more about yellow fever

Rockefeller Foundation



out of the United States, airplane passengers from possibly infected regions in Central and South America are closely watched. Airplanes from these regions are fumigated to kill mosquitoes, and an officer of the United States Public Health Service vaccinates the pilots and other flying employees of airship lines operating between the United States and countries where yellow fever is a menace.

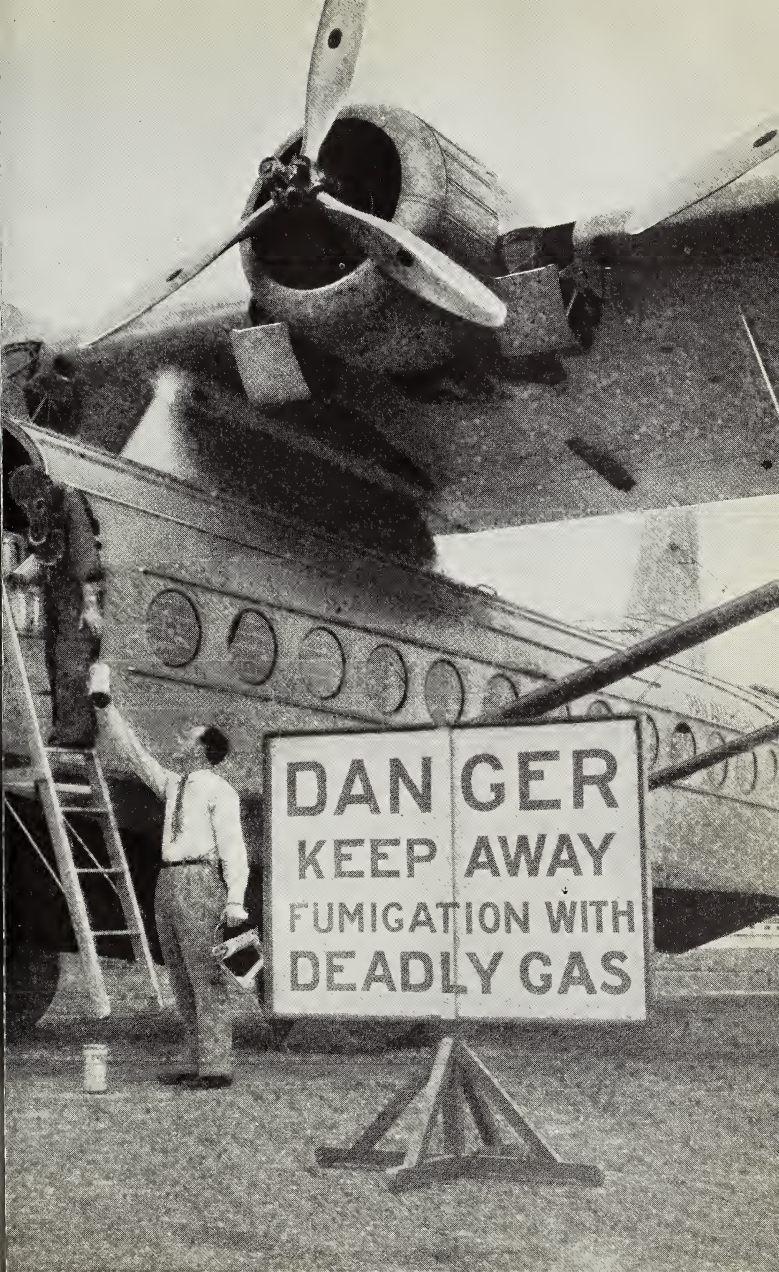
THE DEFENSE FORCES OF THE BODY

You may have heard your mother say that you cannot catch measles or whooping cough because you had the disease when you were younger. You may have heard that some child caught diphtheria because his parents had failed to have him immunized. People who cannot catch a particular communicable disease are said to be immune to it. Those who can catch it are said to be susceptible to it.

There are two kinds of immunity. One kind is called natural immunity. The other kind is called acquired immunity. Natural immunity means that a person is born with a high degree of protection against a particular disease. One race of people may be naturally immune to a disease to which other races are susceptible. Natural immunity to a particular disease may also run in families; or it may vary among individuals in the same family; or it may vary in the same individual at different times in his life. For example, a person may be exposed to a communicable disease and not catch it when he is in good health. But if he is exposed to it when he is overtired or run down, he may catch it. A healthy body is the best defense we have against certain diseases, such as the common cold, tuberculosis, and pneumonia. These are the diseases against which one attack does not give us lasting protection or immunity.

Fumigating an airplane to kill mosquito

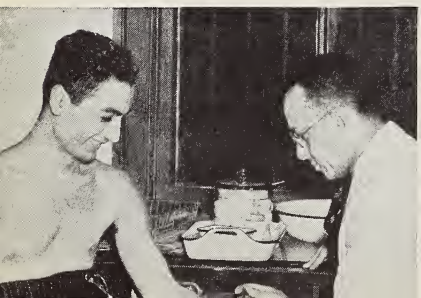
Pan-American Airways


DANGER
KEEP AWAY
FUMIGATION WITH
DEADLY GAS

From your own experience you know that having one cold does not keep you from catching another. A person may have pneumonia several times in his life. Being cured of tuberculosis does not mean that one can never again have tuberculosis. But if a person keeps in good physical condition by eating foods which contain all the essential food elements, particularly the vitamins and minerals, and by getting plenty of rest and sleep, exercise, fresh air, and sunshine, he may be able to overcome the germs of these diseases even after they have entered his body.

How the Body Defends Itself against Tuberculosis

A fine example of the remarkable fighting power, or resistance, of a healthy body is what happens when the body succeeds in overcoming the bacilli of tuberculosis. In case tuberculosis bacilli are swallowed, they may be destroyed by the acid digestive juice of the stomach. If they get into the blood stream, they may be overcome by the white corpuscles, or "policemen," of the blood and lymph. If they find a lodging place in the lungs, or some other place in the body, certain cells move up to surround the spot where the bacilli have gained a foothold. In a short time these cells build a wall around the bacilli. Inside this little jail, or tubercle as it is called, the bacilli can do no harm except to destroy the lung tissue enclosed with them. As time goes on, deposits of calcium take the place of the destroyed lung tissue.



By means of the tuberculin test a doctor finds out whether tuberculosis bacilli have ever entered a person's body

By taking an X-ray picture of the lungs a doctor finds out whether or not a person has active tuberculosis

The body may win this victory over the invading bacilli without the knowledge of the person whose body has been infected. And yet it is very important to know that this infection has taken place. A harmless skin test, called the tuberculin test, is the means by which a doctor finds out whether a person has had a first infection with tuberculosis bacilli. You may have had this test. It is now given as part of the regular health examination in many schools. It is often referred to as the Mantoux test. By the appearance of the skin about the place where a small amount of a substance obtained from tuberculosis bacilli is injected, a doctor can tell whether or not tuberculosis bacilli have ever entered a person's body. If they have—that is, if the test is positive—the doctor will have an X-ray picture taken of the lungs.

The X-ray picture may show that the person does not have active tuberculosis. In this case he may keep the infection from becoming active by building up his health. Everyone in close contact with a person who has a positive tuberculin test should also be examined for signs of tuberculosis. The tuberculin test has been the means of finding many adults with active tuberculosis who, without knowing it, have infected their children. If the tuberculin test shows active tuberculosis, then the person is given the rest in bed which will help his body to overcome the infection.

Acquired Immunity

There are other communicable diseases against which one attack usually gives lasting protection. Examples of these diseases are smallpox, whooping cough, measles, and mumps. The protection given by an attack of a disease of this kind is called active acquired immunity. It is gained by the nature of the active resistance, or fight, put up by the body in its efforts to overcome the germs.

When disease germs become established in a part of the body where they can grow and multiply, chemical substances in the germs stimulate the body to manufacture other substances called antibodies. The antibodies help the body cells to fight the germs. The sick person begins to get well when there are enough antibodies in the blood to overcome the germ invaders. After recovery from the disease large numbers of these antibodies remain in the blood. If the

Studying an X-ray picture of the lungs

same kind of germs should enter the body later on, even years later, the antibodies in the blood enable the body to destroy the germs before they can do any harm. The protection given by the antibodies is called active immunity, because the body was active in acquiring it.

Vaccination

For some diseases there is another way of acquiring active immunity besides actually having the disease. Probably most of you have been protected against smallpox without actually having had this disease. This method of protection is called vaccination against smallpox. It was the first scientific measure ever developed for making human beings actively immune to a communicable disease.

About a hundred and seventy-five years ago a thirteen-year-old boy was studying medicine with a doctor in a town near his home. One day a young country woman came to the doctor's office for advice. She and the boy began talking about smallpox. "I cannot take it because I have had cowpox," she said.

Cowpox is a mild disease of cattle. In those days people who milked cows that were sick with cowpox very often got sores on their hands. The sores healed without causing much trouble.

The young boy, whose name was Edward Jenner, never forgot the words, "I cannot take smallpox because I have had cowpox." When he had become a doctor, he began to collect stories about people who had been protected from smallpox in this way. At last he decided to make an experiment. On May 14, 1796, he took a healthy eight-year-old boy named James Phipps to a farm where cowpox had broken out. Jenner took some matter from a cowpox sore on a dairymaid's hand and placed it in two scratches he

had made on the boy's arm. This was the first scientific vaccination. The name *vaccination* comes from the Latin word *vacca*, which means "cow." After the vaccination sores had healed, it was impossible to give James Phipps smallpox. Within ten years after this first vaccination, the practice had spread all over the world. On July 8, 1800, a five-year old boy was vaccinated in Massachusetts. This was the first vaccination in America.

For eighty years after the introduction of cowpox vaccine, doctors thought that smallpox was the only disease against which human beings could be made immune without having the disease. Then Louis Pasteur discovered that vaccination works because vaccine material contains weakened virus instead of strong virus. Smallpox virus becomes weakened by living in the body of a cow. When this weakened virus is placed in a person's body, it is just strong enough to stimulate the body to manufacture antibodies, but it is not strong enough to make the vaccinated person sick with smallpox. The antibodies stay in the blood for years after the vaccination sore has healed, ready to protect the body from the strong virus of smallpox if it should gain entrance to the body. Smallpox would disappear from the earth if all parents would have each child vaccinated before his first birthday and then vaccinated again whenever the doctor advised it.

After the principle of vaccination had been discovered, vaccines were developed for many other diseases besides smallpox. The vaccine may be a weakened germ (as in smallpox) or a killed germ (as in typhoid fever) or the weakened toxin of a germ (as in diphtheria). Vaccines are employed as a rule to protect well people from a possible future attack of the disease. The most important vaccines in general use are those which protect people from smallpox,

Jenner never forgot the words, "I cannot take smallpox because I have had cowpo

diphtheria, and typhoid fever. Vaccines are also used for protecting little children from whooping cough and scarlet fever.

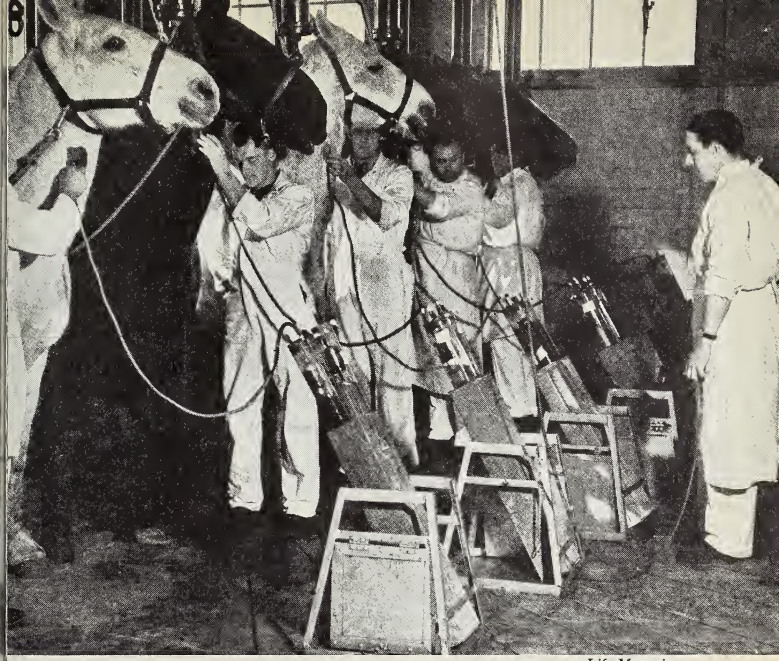
Antibody Serums

When a person actually has a dangerous communicable disease, such as diphtheria, the body may not be able to manufacture antibodies quickly enough or in large enough numbers to overcome the germs and thus help to save the person's life. Fortunately, doctors in treating diphtheria now have the means of increasing the number of antibodies present in the sick person's blood. They can do this by injecting into the patient's body a fluid containing large numbers of antibodies, called diphtheria antitoxin.

In the year 1890, a German scientist named Emil von Behring succeeded in making horses immune to diphtheria by giving them gradually increased doses of diphtheria toxin. The toxin stimulated the horse's body to manufacture antitoxin. This antitoxin, which made the horse immune to diphtheria, was present in the clear liquid part, or serum, of the animal's blood. By drawing off some of the blood and separating off the serum, Von Behring obtained a powerful solution of diphtheria antitoxin.

On Christmas day in 1891 a little girl in Berlin was very ill with diphtheria. Von Behring went to see her and took with him a bottle of diphtheria antitoxin. He put some of this antitoxin into the little girl's arm and she began to get better. From that day to this, diphtheria antitoxin from immunized horses has been used to treat people sick with diphtheria.

Antibody serums or antitoxins have been developed for treating other dangerous diseases besides diphtheria. Among these diseases are scarlet fever, tetanus (lockjaw), and certain types of pneumonia. Serums for treating these



Life Magazine

Taking blood from horses that have been immunized against diphtheria to make diphtheria antitoxin

diseases are obtained in the same way that diphtheria antitoxin is obtained. That is, a healthy horse or other animal is given repeated small injections of a particular germ or its toxin until the animal becomes immune to the disease caused by that germ. The blood serum of the immunized animal may then be used to treat human beings sick with the disease against which the animal was immunized.

The use of pneumonia antibody serums has practically revolutionized the treatment of pneumonia. This dangerous disease is caused by a germ called the pneumococcus. There are more than thirty different types of pneumococci. Anti-pneumococcus serums are now available for several of these

types. A doctor can find out which type of pneumococcus is making a pneumonia patient ill by having the patient's sputum examined in a laboratory. If he finds that the patient has Type I pneumonia, for example, he gives the patient Type I serum. This serum adds thousands of Type I antibodies to those already being manufactured by the body. Very often these extra antibodies turn the tide of battle, and a person who might otherwise have died recovers.

An animal serum containing antibodies of a particular disease is sometimes given to a susceptible person who has been exposed to the disease. If given soon after exposure, the antibodies in the serum will help to keep the disease from developing. This is often done when a person receives the kind of wound in which the germs of tetanus may be present or when little children who have not been immunized are exposed to diphtheria or scarlet fever. Unlike the immunity conferred by vaccines, the protection given by antibody serum or antitoxin lasts for only a short time. The temporary immunity given is called passive immunity. *Passive* is the exact opposite of *active*. The term *passive immunity* is used because the body was not active in manufacturing the protective antibodies.

The Conquest of Diphtheria

In the early part of the nineteenth century scientists observed that some persons seemed to be naturally immune to diphtheria. That is, they did not catch it when they were exposed to it. It was reasoned that such persons must have diphtheria antitoxin in their blood. In 1913 a doctor named Bela Schick discovered a skin test by which the amount of diphtheria antitoxin in a person's blood may be measured. If the amount present is not enough to protect

the person from diphtheria, it may be increased by giving injections of toxin-antitoxin or toxoid. Both are made by treating diphtheria toxin so as to weaken it. This harmless, weakened toxin stimulates the body to manufacture its own antitoxin. Children treated with toxin-antitoxin or toxoid develop an active immunity which usually lasts for life. All babies nine months of age or older should be given this harmless treatment. Six months later they should be given the Schick test to find out whether they have become immune. If not, additional toxoid should be given. It is also advisable to repeat the Schick test before a child goes to school to make sure that he is still protected.

A skin test has also been developed by which doctors can find out whether or not a person has enough scarlet-fever antitoxin in his blood to protect him from scarlet fever. This test is called the Dick test. It was worked out by Doctors George and Gladys Dick. Children who have been exposed to scarlet fever may be given this test to find out whether they need to be protected from scarlet fever.

Scientists are working to discover ways of conquering other diseases. A new drug called sulfanilamide is already saving the lives of people sick with blood poisoning and other diseases caused by germs of the coccus family. Many searchers are trying to find a way to fight infantile paralysis. The war against disease is a war to save life instead of to destroy it.

W. P. A. Federal Arts Project

Dr. Bela Schick giving a child the Schick test. What will this test show?

ARE YOU DOING YOUR BEST TO PREVENT COMMUNICABLE DISEASES?

Do you take the precautions necessary to keep harmful germs from entering your body by way of your mouth and nose?

Do you help to protect your home from flies, cockroaches, bedbugs, and rats?

Do you use only your own toilet articles (washcloth, towel, toothbrush, hairbrush, and comb) and wear only your own hat and coat?

If mosquitoes are prevalent in your community, do you screen the windows and doors of your home during the mosquito season and help to remove or to screen all containers in which water may collect?

Do you try to keep in good health so that your body will be an unfavorable place for germs?

Do you have a physical examination every year and do what the doctor advises you to do?

Have you been vaccinated against smallpox and diphtheria?

The frontispiece to this book shows a boy and girl counting colonies of bacteria that are growing on gelatin across which a fly has walked. They must use a strong magnifying glass to see the bacteria colonies. Are you using the methods of science to gain the knowledge which will help you to protect yourself and others from communicable disease?

1. In the following list of diseases, pick out three which are caused by a coccus, three which are caused by a bacillus, four which are caused by a filterable virus, and one which is caused by a protozoon:

epidemic influenza	yellow fever	measles
tuberculosis	malaria	typhoid fever
scarlet fever	pneumonia	blood poisoning
smallpox	diphtheria	

2. Tell what disease or diseases you associate with each of the following insect carriers: body louse, pediculus, rat flea, *Anopheles* (mosquito), *Aëdes aegypti* (mosquito).

3. Tell what great accomplishment you associate with each of the following names: Louis Pasteur, Charles Nicolle, Kitazato, Alphonse Laveran, Ronald Ross, Walter Reed, General Gorgas, Edward Jenner, Emil von Behring, Bela Schick.

4. Select the word or phrase which best completes each incomplete statement. (*Do not write in the book.*)

a. A child may acquire active immunity against diphtheria by (1) antitoxin · (2) toxin-antitoxin or toxoid · (3) following all the rules of healthful living.

b. Passive immunity to tetanus may be conferred by · (1) having tetanus · (2) putting an antiseptic on a wound · (3) tetanus antitoxin.

c. The best defense we have against the common cold is · (1) the natural resistance of a healthy body · (2) antitoxin · (3) active immunity.

d. The only two ways in which a person can be given active immunity to smallpox are by · (1) vaccination · (2) building up the resistance of his body · (3) having smallpox · (4) washing his hands frequently with soap and water · (5) the Dick test.

e. People who can take a particular disease are said to be · (1) immune to it · (2) susceptible to it · (3) exposed to it.

f. The way in which the body fights a particular communicable disease is to manufacture · (1) red corpuscles · (2) antiseptics (3) antibodies.

g. The poisons produced in the body by harmful germs are called (1) antibodies · (2) toxins · (3) microorganisms.

THINK ABOUT THESE QUESTIONS

1. What are some of the ways in which each individual may protect himself, his family, and his neighbors against the germs of communicable diseases which find favorable locations in the body by way of the mouth and nose?

2. In 1806 Thomas Jefferson said, "Future generations will know about smallpox from history only." Who was Jefferson? Was he a good prophet in regard to smallpox? When Jefferson made this prophecy how many years had gone by since the discovery of vaccination? How many years have now gone by since the discovery of vaccination? Is there any excuse for cases of smallpox today? How may we make Jefferson's prophecy come true?

3. Louis Pasteur, who discovered the true nature of communicable diseases, once said, "It is now in the power of man to make communicable diseases disappear from the face of the earth." What diseases is it now possible for man to wipe out? What are some of the interesting things scientists are doing today in their attempts to find ways of fighting communicable diseases? Do you watch the papers for news about the work being done on infantile paralysis, influenza, pneumonia, and other communicable diseases?

DO THESE THINGS

1. Talk over in class how the discovery of germs as the cause of communicable disease has made life safer for the boys and girls of today than it was for the boys and girls of seventy-five years ago.

2. If the community in which you live is subject to malaria, work out a plan for finding the breeding places of mosquitoes. Ask the public-health officer to speak to the class and tell what the members can do to help in the control of malaria.

3. Have a committee of the class report on the building of the Panama Canal. Then discuss in class the following questions: Why did people think it would be a good thing to build a canal across the Isthmus of Panama? Who first started to build

the canal? Why did they have to abandon the project? What difficulties were encountered by the American builders? How were these difficulties overcome? How did the work of Walter Reed make possible the work of General Gorgas? Why is the building of the Panama Canal called "one of the greatest public-health achievements of the twentieth century"?

4. Make a class chart to show which pupils have had chicken pox, scarlet fever, mumps, measles, whooping cough, and other communicable diseases. Has any pupil had more than one attack of any of these diseases? What happens in the body during the first attack of a communicable disease? Why does this usually prevent a second attack of the same disease?

5. Make another chart to show which pupils have been immunized against diphtheria, scarlet fever, whooping cough, and smallpox. Explain how vaccination against smallpox works.

6. Find out what the regulations in your community are regarding vaccination against smallpox. Ask your department of health to give you the number of smallpox cases and deaths in your state or province last year. How many cases were there in the whole United States? How many in Canada? How might these cases and deaths have been prevented?

7. Find out something about the history of tuberculosis. What contribution to our knowledge of the disease and how to fight it were made by Robert Koch and Edward Livingston Trudeau? What are some of the modern weapons for fighting tuberculosis? Ask the school nurse, or a public-health official, or a member of your local tuberculosis association to tell the class about the fight against tuberculosis in your community.

8. Have each member of the class write down all the famous medical discoveries that he or she can remember. Talk over in class what would have been the probable effect on the control of disease if one or all of the discoveries listed had been kept secret by their discoverers and the benefits made available only to people who could afford to pay large sums for them. What is the greatest difference between the patent-medicine proprietor and the true scientist?

9. Should you like to see bacteria growing? To do this you must prepare the right kind of food and then plant bacteria on it. The food is called a culture medium or a culture garden. You may prepare culture gardens by boiling together one quart of water, five grams of agar agar (a substance like gelatin, made from seaweed), five grams of beef bouillon cubes, one quarter teaspoonful of baking soda, and one quarter teaspoonful of salt. Gelatin may be substituted for the agar agar. Pour a thin layer of the mixture while it is hot over the bottom of several small petri dishes (special glass dishes with tight-fitting lids) or into test tubes, and cover tightly. Sterilize the dishes or test tubes containing the culture gardens by heating them for one hour over boiling water in the covered top part of a double boiler. Then cool. If test tubes are used they should be allowed to cool on a slant.

Bacteria from many different sources may be planted in the sterile culture gardens. You may touch one with the tip of a finger and another with a pencil point or the edge of a coin. You may test the air for bacteria simply by leaving the cover off one petri dish for a time. Other things that may be tested are a drop of water, a drop of milk, and material from your mouth obtained by rubbing a bit of sterile cotton over your teeth.

After planting the culture gardens cover them tightly and place them in a warm dark place. After two days examine them to find out whether any spots have appeared on the culture gardens. These spots are colonies of bacteria. Each colony usually consists of the descendants of a single bacterium.

If bacteria are provided with the proper food, moisture, and warmth, each one usually develops into two new ones every fifteen minutes. Starting with one bacterium placed in favorable surroundings, how many bacteria would you have at the end of two hours?

Discuss in class the answers to the following questions:

a. What conditions are favorable for the spread of bacteria from one person to another? What conditions are unfavorable?

b. Why are our bodies good places for bacteria to grow in? What are some of the ways in which we may make our bodies unfavorable for the growth of certain kinds of microorganisms?

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

organism
microorganism
bacteria
protozoa
cocci
pneumococci
streptococci
staphylococci
bacilli
spirilla
filterable viruses
mechanical carrier (of disease germs)
infest
sodium fluoride
typhus fever
pediculus
pediculosis
bubonic plague
agar agar
rat harborage
Anopheles (mosquito)
Aëdes aegypti (mosquito)
resistance
natural immunity
tubercle
sulfanilamide
Mantoux test
active acquired immunity
vaccine
antibody
antibody serum
antitoxin
passive immunity
Schick test
Dick test
toxin-antitoxin
toxoid
tetanus
culture medium

2. Form the singular case of the name of each one of the microorganisms listed above. Of the microorganisms listed, which are family names and which are the names of particular microorganisms?

3. Tell the difference between the following words or terms:

natural immunity, active acquired immunity, passive immunity
Anopheles (mosquito), *Aëdes aegypti* (mosquito)
vaccine, antibody serum
toxin, antitoxin, toxin-antitoxin
Mantoux test, Schick test, Dick test
bacteria, protozoa, filterable viruses
organism, microorganism
sodium fluoride, sulfanilamide

UNIT VIII

Taking Care of the Sick and Injured

In every period of history, from the days of ancient Greece when Hippocrates, "the Father of Medicine," lifted up before his students the shining ideal of what a doctor should be, there have been physicians who have done everything they could to relieve the sufferings of the sick and injured. But little can be done in any age to cure sickness unless the treatment is based on scientific knowledge of the cause of the disease and of the body's equipment for fighting it.

Nowadays the resources of medical science are much greater than they used to be. There are methods of treating disease which appear almost to produce miracles of healing. There are instruments for exploring the human body which would have seemed like black magic to the simple folk in earlier ages. The specter of infection no longer stalks unhindered from ward to ward and from bed to bed in hospitals built for the care of the sick and injured.

It is mainly through doctors of medicine that we may take advantage of the wonderful discoveries of medical science. It is only by steering clear of self-medication that we may discourage the quacks and the sellers of patent medicines, who in every age have tried to make money out of human distress. But even though we should turn to the medical profession for help in case of illness and accidental injury, there are many things that we can do to make sick people more comfortable and to save life when an accident has happened.

DO YOU KNOW

Who were the surgeons in the early days?

Who helped to found the first hospital in America?

Who Florence Nightingale was and what she did?

Why people used to fear going to a hospital much more than they do today?

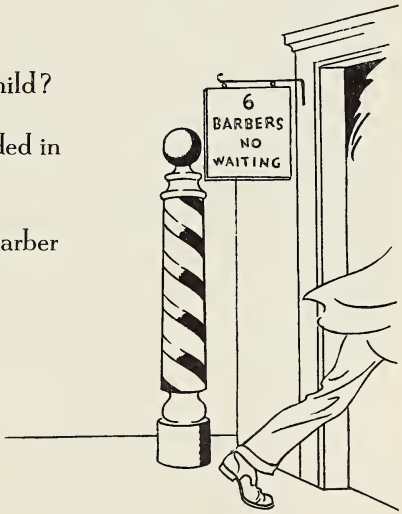
How to guard against infection while helping to take care of someone sick with a communicable disease?

How to give medicine?

How to amuse a sick child?

What should be included in a first-aid kit?

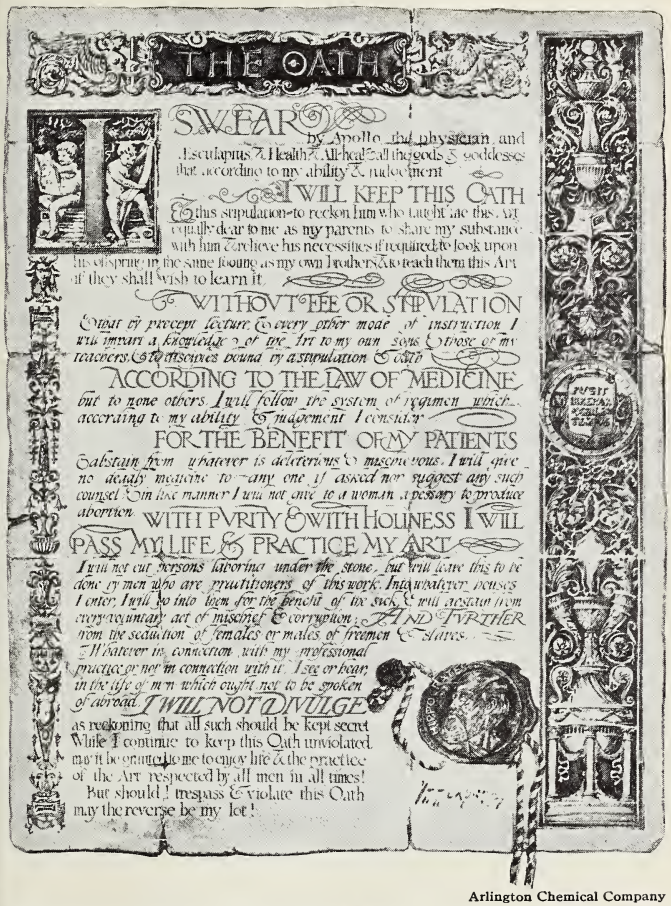
What the colors in a barber pole stand for?



THE CARE OF THE SICK IN FORMER TIMES

In ancient times, in Egypt and Greece, there were shelters for the sick maintained in religious temples, with priests as the physicians. The warlike Romans had an efficient system of military hospitals, and their doctors were especially skilled in wound surgery. From the tenth century onward there were great medical schools in Europe where boys, and even some girls, were trained by learned professors in the ancient medical wisdom of the Greeks, Romans, and Arabians. The hospitals in the Middle Ages were usually attached to the monasteries, where monks and nuns looked after the patients. Surgery as then practiced was looked down upon by the regular physicians, because it was largely in the hands of barbers. The barber pole of today is a reminder of the time when barbers performed all sorts of operations. The red stripe stands for blood and the white stripe for the bandage.

Among the colonists who came from the old world of Europe in the seventeenth century to establish homes in the new world of America, there were a few who had some medical knowledge. The governors of some colonies brought medical books with them from Europe and gave medical advice to those who sought it. Many clergymen had two professions, the preaching of the gospel and the treatment of the sick. Barbers practiced surgery as they had done in the countries from which they came. As time went on, men who had special skill in treating the sick or who had received special training in the medical schools of Europe began the practice of medicine in America. These "doctors on horseback," as they have been called, played an important part in the pioneering ventures of the New World. There were no obstacles of road or weather that they did not overcome in order to reach their patients.


THE OATH
I SWEAR by Apollo the physician and Aesculapius & Health & All-heal & all the gods & goddesses that according to my ability & judgement
I WILL KEEP THIS OATH & this stipulation-to reckon him who taught me this Art equally dear to me as my parents to share my substance with him & relieve his necessities if required to look upon his offspring in the same footing as my own brothers & to teach them this Art if they shall wish to learn it
WITHOUT FEE OR STIPULATION
but by precept lecture & every other mode of instruction I will impart a knowledge of the Art to my own sons & those of my teachers & to disciples bound by a stipulation & oath
ACCORDING TO THE LAW OF MEDICINE
but to none others. I will follow the system of regimen which according to my ability & judgement I consider
FOR THE BENEFIT OF MY PATIENTS
& abstain from whatever is deleterious & mischievous. I will give no deadly medicine to any one if asked nor suggest any such counsel & in like manner I will not give to a woman a pessary to produce abortion
WITH PURITY & WITH HOLINESS I WILL PASS MY LIFE & PRACTICE MY ART
I will not cut persons laboring under the stone but will leave this to be done by men who are practitioners of this work. Into whatever houses I enter I will go into them for the benefit of the sick & will abstain from every voluntary act of mischief & corruption & FURTHER from the seduction of females or males of freemen & slaves.
Whatever in connection with my professional practice or not in connection with it I see or hear in the life of men which ought not to be spoken of abroad I WILL NOT DIVULGE
as reckoning that all such should be kept secret.
While I continue to keep this Oath unviolated may it be granted to me to enjoy life & the practice of the Art respected by all men in all times!
But should I trespass & violate this Oath may the reverse be my lot!

Arlington Chemical Company

The oath, or pledge, of Hippocrates, which medical students still take in substance when they become physicians

Benjamin Franklin, who had a hand in practically every great and good movement of his time and country, helped to found the first hospital in America. Its doors opened in the city of Philadelphia in 1751. A few years later the first American medical college was opened in the same city.

But no amount of skill and devotion in any age can contribute a great deal to the cure of any sickness the cause of which is not known. The last half of the nineteenth century stands out in history as the period in which more progress was made in the healing art than in all the two thousand years and more which had gone by since the time of Hippocrates. The principal reasons for this progress were the discovery of ether as a general anesthetic, the discovery of the cause of infection, and the great improvements made in hospitals and in the nursing care of the sick.

How Modern Nursing Developed

At the halfway mark of the nineteenth century, doctors were almost at the point of despair. A great deal had been learned about the treatment of disease, but very little was known about how certain infections are spread. The discovery of ether as a general anesthetic in the forties had made possible the most delicate and prolonged operations, but even the most skillful surgeons hesitated to open as much as a boil because of the fear of infection. The shadow of death lay over every hospital. It did not seem to matter very much whether hospitals were clean or dirty—an infection called hospital gangrene stalked the corridors and seemed almost to pass through the walls. Nursing, except that done by the Sisters of religious orders, was looked upon as an occupation for the humblest type of women. Many dirty incompetent old women took up nursing simply because it seemed to be an easy way to make a living.

And then, like a hearty wind driving away the fog, came Florence Nightingale bringing light and order into the hospitals. To Florence Nightingale it was all nonsense that cleanliness, good food, pleasant surroundings, and skillful nursing made little or no difference in a sick person's chances of getting well. Her big opportunity came in 1854 when England, France, and Turkey were fighting a war with Russia in the Crimean Peninsula on the Black Sea. Florence Nightingale, with a band of nurses, went to the army hospitals opposite Constantinople to nurse the British soldiers wounded in the war. She knew nothing about

"The Lady of the Lamp." Late at night Florence Nightingale visited the wounded soldiers to see that all was well

Warner Bros. Pictures, Inc.

germs,—no one did,—but she believed that a hospital should be an absolutely clean and orderly place and that sick people should be made as comfortable as possible. The news of what Florence Nightingale did in the Crimea made a story that echoed around the world. In five months (from February, 1855, to June, 1855) the deaths among the soldiers treated in the hospitals under her management dropped from 420 a thousand to 22 a thousand.

After the war Florence Nightingale was a national heroine, and the longer she lived the greater became her fame. Through the force of her own example and her genius for inspiring others to carry on the work she had started, she succeeded in lifting nursing from its lowly state to that of an honored profession. Also, as a result of her efforts, a new era opened in the hospitals. From many countries letters came to Florence Nightingale asking for advice in the building of new hospitals or the rebuilding of old ones. With her, modern hospital construction began.

Banishing the Fear of Infection from Hospitals

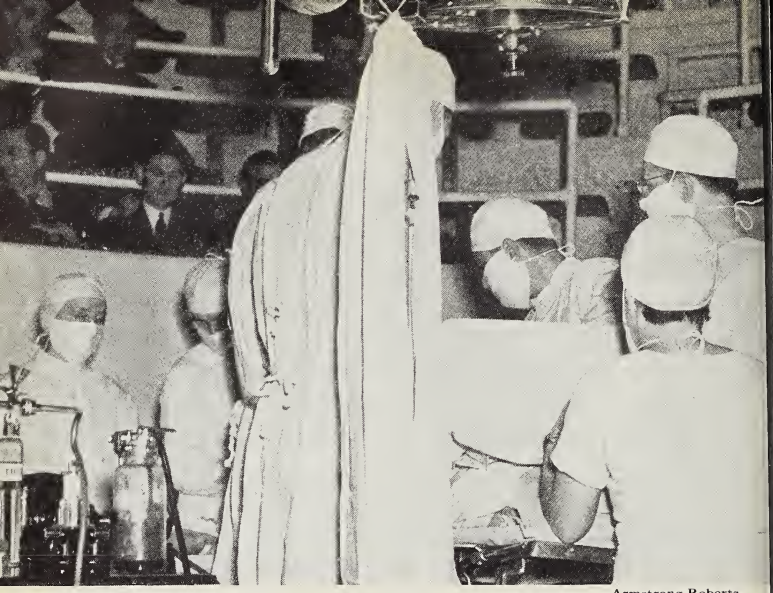
In the same year, 1854, that Florence Nightingale sailed to the Crimea, a twenty-seven-year-old English house surgeon might be seen walking the wards of a hospital in Edinburgh, Scotland. This young doctor was to write the last chapter in the story of hospital cleanliness begun by Florence Nightingale. His name was Joseph Lister.

It made Lister very sad to witness the suffering and even death that often followed the simplest operation. For many years he made a special study of wound infections. Then in the year 1865 a friend called his attention to the writings of Louis Pasteur. He found in Pasteur's belief that infections are caused by germs the answer to the problem that had long been puzzling him. Looking about for some way

of keeping germs out of wounds he thought of carbolic acid, which had already been used to disinfect sewage. On August 12, 1865, Lister used a solution of carbolic acid in dressing a compound fracture. In this kind of fracture one or both of the splintered ends of the broken bone pushes up through the flesh and skin. In the past a wound made in this way had almost always become infected. To Lister's joy, the wound treated with carbolic acid healed smoothly and normally. After that, whenever he operated, he used a solution of carbolic acid to disinfect his hands, his instruments, and the dressings he used to cover the wound. He even had carbolic acid sprayed into the air while he was operating.

Today new methods of aseptic cleanliness have largely taken the place of Lister's method of antiseptic cleanliness. By *aseptic* is meant "not septic," that is, not germ-bearing. Everything used during an operation is boiled or steamed to destroy all living germs on it, and the skin of the patient at the place of the operation is sterilized with an antiseptic. The surgeon and his assistants and the nurses present at an operation wear sterile gowns and masks and rubber gloves. Lister's demonstration of the fact that wound infections are caused by germs and that the body has remarkable powers of healing injured tissue, if it is protected from germs, has robbed the operating room of most of its terrors.

Thanks to Pasteur and Lister and Florence Nightingale and their followers, going to a hospital no longer brings to the minds of most people the thought, "I am going to die." Modern science has bestowed the power to banish the shadow of death once cast by the nurses and physicians *who did not know* that on hands and clothing and instruments they were spreading the seeds of infection. Today we think of the hospital as the place above all others where human beings are equal before the majesty of medical sci-



Armstrong Roberts

An operation in a modern hospital.
What has been done to prevent wound infection?

ence. For all sick people who enter its doors the miracles of modern surgery and the knowledge and skill of modern surgeons, physicians, and nurses are available. Today many communities have well-equipped hospitals for the care of the sick and injured. Most hospitals have clinics where people may be examined and treated for a small fee, or none at all if the patient is unable to pay.

TAKING CARE OF SICK PEOPLE AT HOME

Illness is not a welcome guest, but there is practically no home which it does not visit occasionally. Good homemakers ought to be prepared for illness even though they do everything they possibly can to prevent it.

The first thing to do when a member of the family becomes ill is to call a doctor. The physician knows the medicines and other treatments which are safe to use in cases of illness. He knows the measures which have been tested and found safe and workable in the prevention of disease. He has been trained to use the instruments which have been invented for exploring the human body. The family doctor holds an honorable place in the history of our country. With each new generation he has been able to do more for his patients because of the new discoveries made in the science which he practices.

If a person is very ill, the doctor may think that trained nursing care, either at home or in a hospital, is advisable. Families that cannot afford trained nursing care may call in a visiting nurse to give the necessary treatments and to teach someone in the family to take care of the patient.

Guarding against Infection

If someone in the home has a communicable disease and is isolated by order of the health department, no one is allowed to enter the sickroom except the doctor and the nurse or the member of the family appointed to take care of the patient. It is seldom necessary for a boy or girl to take charge of a communicable-disease case of this kind.

Sometimes, however, the sick person may have a communicable disease, such as a bad cold or grippe or tonsillitis, which is not usually isolated. In helping to take care of a person sick with this kind of infection, certain precautions are necessary to guard yourself and others from the infection. Under no circumstances should a person who has a cold or some other communicable disease go near young children or babies. They are much too young to know how to protect themselves from infection.

When you are with the patient make sure that he covers his mouth and nose with a handkerchief of soft paper or clean cloth while coughing or sneezing. Pin a paper bag to the mattress for the patient to use in throwing away his paper handkerchiefs, and burn it when full.

It is a good idea to keep a coverall apron or smock in the sickroom that you can put on while you are with the patient. Always take it off before leaving the room. Scrub your hands thoroughly with warm water and soap immediately after doing something for the patient or after handling anything he has touched. The patient's dishes should be washed separately and kept away from those used by other members of the family.

Making the Patient Comfortable

A boy or girl in a busy home where there is illness may help a great deal by assuming extra household duties and by doing everything possible to make the patient comfortable and give him pleasure. Having the face and hands bathed is often very refreshing. This should always be done before the patient has his breakfast and before he is settled for the night. A person who must stay in bed for several days should have a whole bath every day. But giving a bed bath and making the bed with the patient in it requires training and practice. If it is ever necessary for you to do these things for a sick person, ask a nurse or some other experienced older person to show you how. Some girls—and boys too—take courses in home nursing in which they learn many of the details of good nursing care.

The sickroom should be made as attractive as possible, although it should be kept free of unnecessary furniture. The ideal sickroom is one which may be closed off from the other rooms in the home so that the patient may have

what he needs most—peace and quiet. Make sure that the bed is so placed that the patient does not face a direct light. He should have plenty of fresh air, unless the doctor advises otherwise, but he should be kept out of drafts. A screen placed between the bed and an open window is a good protection.

See that everything the patient needs is within easy reach. A bedside table, the top of which is on a level with the mattress, is a great convenience. On the table place a watch or clock, a glass and a pitcher of fresh water, a handkerchief or package of paper squares, and a bell for the patient to ring when he wishes to call someone.

The patient's medicines should be kept on a tray by themselves out of reach of small children. In pouring medicine from a bottle, pour from the side opposite the label so that the liquid will not drip down over the label. In giving pills offer them to the patient in a spoon or small glass. Do not pick them up in your fingers. Always read the label *twice* before giving any medicine, and follow exactly the directions given. A record should be made in writing each time a medicine is administered. Note the amount of the dose and the hour; as, for example: Two pink pills, 10 A.M.

If it is necessary for you to take the patient's temperature, ask the doctor to show you how this is done. Keep the thermometer in a small glass or cup containing absorbent cotton and alcohol, or some other antiseptic recommended by the doctor. Always wipe the thermometer on

Learning how to take care of a sick baby in a course in home nursing

a bit of sterile cotton before taking the patient's temperature and again afterward. Do not wash the thermometer in hot water, as this will ruin it. Always make a record of the temperature in writing and the hour when it was taken; as, for example: 99.5°, 6 P.M. Take the patient's temperature only at the hours specified by the doctor.

Boys and girls may be asked to take meals to a sick person. If the doctor says that the patient may eat what the rest of the family has for meals, do not give him large helpings. A heavily loaded plate may take away the appetite of a sick person. It is best to use a pitcher to transport a liquid, such as soup or milk or fruit juice, and pour it into the cup or glass just before you serve it. Always cover the tray with a clean napkin or doily even if it is only a paper one. A surprise on the tray may make a meal more appetizing. A flower, or a small cheap toy, or a pretty picture cut from a magazine will often please a sick child. If the patient is not too ill, cheerful conversation may add to the enjoyment of the meal.

Do the best you can to keep the patient quiet and as contented as possible. Tell about interesting or amusing things that happen in the family circle or at school but do not relate bad news or anything that might cause worry. If the patient is the mother of the family, do not run to her with such questions as "What shall we have for dinner?" or "Where is my new shirt?" A home naturally seems strange and everyone in it may feel neglected when Mother is ill, but she will get well much faster if she knows that her family is making the best of things.

Children who are recovering from an illness are a real problem in the home. Very often the doctor makes a child stay in bed some days after his sickness has been cured. Illness, especially if there is fever, makes extra work for the

A good home nurse does her best to serve appetizing meals

Coons

body, and staying in bed afterward may be necessary to give the heart and other organs a chance to become thoroughly rested.

Older boys and girls are equipped better than anyone else in the home to amuse a child during a period of convalescence. It is fun to hunt for or to invent quiet games that two can play, or that the child can play by himself. An older brother or sister may teach a convalescent child to make things out of inexpensive material such as paper, molding clay, bits of cloth, clothespins, and corks. Children like to cut out pictures from old magazines and paste them into scrapbooks and to draw and color pictures. A convalescent child should not be allowed to read for long at a

"Once upon a time there were three little pigs who—"

Keystone

time and then only when he can sit up in bed with a strong light falling on the book from above and behind.

Children who enjoy music and storytelling may be kept quiet and happy by the hour if it is possible to have a radio in the sickroom. The person who operates the radio should use common sense in the selection of programs and not turn on those likely to excite the child. Older boys and girls may also read or tell stories to a convalescent. In doing this they will gain practice in one of the oldest and most beautiful of the arts, the art of using the human voice as an instrument to give clearness and meaning to the spoken word.

DEALING WITH EMERGENCIES

Once in a while a boy or girl must take charge when someone is hurt in an accident. A person who keeps his head and knows what to do may often prevent further injury or even loss of life.

Getting a doctor speedily is very important when a serious accident occurs. Post in a place near the telephone in your home the name and telephone number of your family physician so that he can be called without delay. If the doctor is not at home, the quickest way to get help is to ask the police department to send an ambulance. Any policeman or telephone operator will call an ambulance for you. Be sure to give the correct address of the place where the ambulance is to come. The ambulance will arrive quickly, as it has the right of way over other vehicles. If you live in the city you have often seen the police hold up traffic for an ambulance with its clanging bell as it hastens to or from the scene of an accident.

While waiting for the doctor or the ambulance keep the injured person warm and as comfortable as possible. See

that he has plenty of air. Examine him carefully to find out the extent of his injuries, but *do not move him* any more than is absolutely necessary to give first aid. This is especially important if any bones are broken. Severe bleeding, stoppage of breathing, and poisoning must have *immediate treatment*. In the next unit you will learn how to give these forms of first aid.

Shock is present in almost all serious injuries and in many slight ones. It is shown by paleness, rapid pulse, sweating, thirst, and feeble, shallow breathing. The patient may be partly or totally unconscious. After giving the first-aid treatment necessary to save a person's life, you may need to treat him for shock unless the doctor has arrived.

In case of shock place the patient on his back with his head lower than his body unless his head has been injured. In cases of head injury raise the head slightly. Cover the patient with coats or blankets and apply hot-water bags or hot bricks or hot stones wrapped in cloth or newspapers. Be careful not to burn him. A light hot-water bag placed over the heart helps to stimulate the heart action. Do not give anything by the mouth unless the patient is fully conscious and can swallow without difficulty. If he is able to swallow give him a stimulating drink, such as hot coffee, hot tea, or one-half teaspoonful of aromatic spirits of ammonia in a half glassful of hot water.

First-Aid Cabinet

Another way in which you may prepare for emergencies is to have a first-aid kit in your home. Handy first-aid kits may be purchased at the drug store, or the supplies may be purchased separately if you prefer. All first-aid material and medicines should be carefully labeled and kept in a cabinet out of reach of small children.

A first-aid cabinet for home use should contain the following articles:

A clinical thermometer for taking body temperature

A small package of absorbent cotton for washing wounds

A small package of sterile gauze for wound dressings

A roll of two-inch adhesive plaster for fastening bandages

A bar of yellow kitchen soap for scrubbing the hands before dressing a wound

Scissors for cutting gauze, adhesive plaster, etc.

A hot-water bag

An ice bag

An eyecup

Boric acid (four ounces) for use in making an eyewash (one level teaspoonful in a glass of boiled water)

A tube of white vaseline or tannic-acid jelly for treating small burns

An antiseptic such as iodine, $3\frac{1}{2}$-per-cent solution (two ounces), for painting all breaks in the skin. Keep the iodine bottle tightly closed with a glass or rubber stopper to prevent evaporation. If iodine is kept too long or the bottle is not tightly sealed, the solution will become so strong that it may cause a serious burn when used.

Aromatic spirits of ammonia (two ounces) for use as a stimulant in faintness or shock.

It is convenient to have toothpicks for cotton swabs, wooden tongue blades, paper napkins or paper handkerchiefs, and any all-purpose antiseptic your doctor recommends, diluted and ready for use.

Galloway

The supplies in a first-aid cabinet should be neatly arranged and clearly labeled

ARE YOU DOING YOUR BEST TO PREPARE YOURSELF TO DEAL WITH ILLNESS AND EMERGENCIES?

Is your doctor's name and telephone number posted in a place where it can be found quickly?

Do you know the hospital and clinic facilities of your city or neighborhood?

Do you know how to guard yourself and others against infection in case you are needed to help in caring for a person sick with a communicable disease?

Do you do everything possible to keep your home quiet and in good running order when someone is ill?

Do you do what you can to keep the patient as comfortable and as cheerful as possible if you are allowed in the sickroom?

Do you keep calm so that you can think what to do when an emergency happens?

Do you have a first-aid cabinet in your home placed out of reach of small children?

TRY THESE TESTS

1. What name do you associate with each of the following terms?

the father of medicine
the father of antiseptic surgery
the founder of modern trained nursing
the father of the germ theory of infection
the founding of the first American hospital

2. Choose the best ending for each of the following sentences. (*Do not write in the book.*)

a. Wound infections are no longer spread from one patient to another in hospitals because · (1) hospitals are kept very clean (2) everything which comes in contact with a wound is made free of germs · (3) the nurses and doctors wash their hands frequently.

b. In helping to take care of someone with a bad cold, one good way to prevent the spread of the infection is · (1) to wash the hands thoroughly with soap and warm water immediately after leaving the sickroom · (2) to have plenty of fresh air in the sickroom · (3) to gargle with salt and water after leaving the sickroom.

c. A sick person will get well more quickly if he has · (1) many visitors · (2) someone to feel sorry for him · (3) quiet and freedom from worry.

THINK ABOUT THESE QUESTIONS

1. How did Florence Nightingale's campaign for cleanliness in the army hospitals of the Crimean War fit in with our modern knowledge of infection although she knew nothing about germs?

2. Why is it necessary to put an antiseptic on a wound received accidentally? What is the difference between the antiseptic method and the aseptic method?

3. What are some of the things boys and girls may do when there is illness in the home so as to keep the household running smoothly and the patient quiet and free from worry?

4. What are the general principles of first aid which everyone should know?

5. Why is it dangerous to use old iodine?

DO THESE THINGS

1. Find out more about the lives of Florence Nightingale and Joseph Lister. It would be interesting to write a play about one or the other and give it for another class, for the whole school, or for the parents.

2. Find out about the training of a modern nurse. Visit a nurses' training school, if possible, or ask a graduate nurse to tell the class about her training.

3. If the superintendent of the local hospital is willing, have a committee of the class visit the hospital to find out what measures are taken to sterilize instruments, bandages, operating gowns, masks, and gloves, etc., so as to prevent the infection of a wound during an operation.

4. Assemble a first-aid kit for your classroom if you do not already have one. Appoint a ways-and-means committee to take charge of acquiring the different articles needed. Appoint a maintenance committee to check up on the supplies and to notify the ways-and-means committee when new supplies are needed. Appoint a first-aid committee to administer first aid under the supervision of the teacher or the school nurse when someone in the class is hurt in school. Change the membership of these committees from month to month so that each boy or girl may have a chance to serve.

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

quack
general anesthetic
prolonged
hospital gangrene
incompetent
construction
compound fracture
aseptic
convalescence
shock
boric acid
aromatic spirits of ammonia
stimulant
tannic-acid jelly
isolate
theory
clinical thermometer
surgery

2. Complete each of the following sentences with a word or words from the list at the bottom of page 222:

a. Mabel used a __?__ __?__ to take Donald's temperature.

b. In yesterday's newspaper a __?__ advertised a "sure cure" for rheumatism.

c. Mrs. Jones discharged her housemaid because the maid was __?__ and did not keep the kitchen clean.

d. The doctor gave Mary a __?__ __?__ when he took out her tonsils because he did not wish her to be conscious during the operation.

e. Joan helped to amuse little Peter during his __?__ from chicken pox.

f. Old Mrs. Allen suffered a slight __?__ after a fall, and Philip gave her a __?__ as soon as she could swallow without difficulty.

UNIT IX

Home Safety and First Aid

People returning home from an automobile trip sometimes say as the car is run into the garage, "Well, here we are, safe at home." Home, from the time of the caveman until now, has been considered a place of refuge—a safe haven from the storms and terrors of the outside world. In our time this idea of home is not borne out by the facts. Look at the graph on page 226. Does it surprise you to learn that there is not much difference between the number of lives lost because of motor-vehicle accidents and the number lost in home accidents?

Now compare the number of home-accident deaths with those classed as occupational; that is, deaths that occur because of accidents that take place while people are at work. Notice that it is nearly twice as safe to be at work as to be at home. This does not mean that there are fewer accident hazards in a factory than in a kitchen or that it is safer to sit in a moving truck than in an easy chair. What it does mean is that so much more time is spent in the home than out of the home that there is more time for accidents to occur. It also means that in industries accident-prevention work has been going on for many years. Employers and employees working together to prevent accidents have succeeded so well that fatal work accidents have been cut by 50 per cent since 1913.

If parents and their children would work together to prevent accidents in the home as efficiently as employers and employees are working to prevent occupational accidents, our homes would soon become safer places in which to live.

DO YOU KNOW

Which of these two types of accident causes the most injuries in the home?

What act causes the greatest number of falls?

What type of accident in the home causes the most injuries to little children?

What to do in case of fire in the home?

How to treat a burn?

How to rescue a victim of electric shock?

What to do when someone has swallowed a poison?

Why the garage door should always remain wide open when the automobile engine is running?

How to give artificial respiration?

Why broken glass should never be thrown into a waste basket?

How to stop bleeding from an artery?

Ways of teaching safety precautions to young children?

PREVENTING FALLS

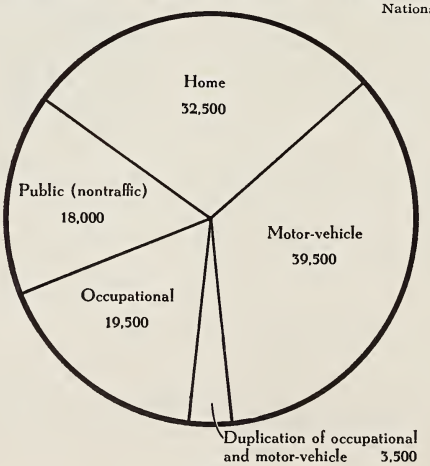
In order to make a plan for preventing accidents in the home it is necessary to make a study of home accidents and their causes. An analysis of all types of home accidents shows that by far the leading type is falls. In fact, falls are second only to motor-vehicle accidents as a cause of accidental death. The majority of fatal falls take place in the home. People sixty-five years old and over are the ones who suffer most from falls. But very often the cause of the fall is carelessness on the part of a younger person.

Disorder is the principal cause of falls. By disorder is meant things out of place. The place for a cake of soap, for example, is in its container. If the soap, instead of being kept in its proper place, is left on the bottom of the bathtub

"

Find the number of people who lost their lives in accidents in the United States in 1937, by adding the figures in the four large sectors and subtracting 3500 from the total. The figure 3500 is the number of people killed in motor vehicles while at work and is reported under motor-vehicle accidents as well as under occupational accidents

National Safety Council



If the owner of this foot should fall downstairs, whose fault would it be?

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American Red Cross

or on the floor or on the stair treads, a person who steps on the soap and falls and breaks his arm or his leg or his neck may be said to have suffered injury or death because of disorder. Other examples of things which may be out of place and so cause falls are toys or other objects left on the floor or stairs; brooms, mops, pails, and other cleaning equipment left in dark hallways or on stair landings; electric-light cords stretched across parts of the floor where people walk; and furniture left out of place so that people may stumble over it.

Other conditions which may cause falls are slippery floors and small loose rugs which slide under the feet; soapsuds, water, or grease spilled on the floor; ice on walks or steps; torn carpets; loose or broken stair treads; shaky handrails; and poor lighting. Basement stairs are often the scene of falling accidents because they are likely to be poorly lighted. It is wise to have an electric-light switch both at the head and at the foot of all stairs. If this is not possible it is a simple matter to put up a hook or bracket to hold an electric flashlight. It is also a good plan to paint three or four white stripes on the last step of the basement stairs to make it clearly visible.

Small rugs may be kept from skidding under the feet by putting nonslip pads under them. To prevent falls while getting in or out of the bathtub, a strong handhold should be fastened securely on the wall over the tub and a rubber mat placed in the bottom of the tub.

Good Housekeeping Institute

How is this girl helping to prevent falls in her home?

The personal factor most often involved in bad falls is standing on an insecure perch while trying to reach up to a high place. A rocking chair may be a comfortable safe seat in which to sit and knit or read, but it is a dangerous place on which to stand when one wishes to get something from a high shelf or to straighten a picture. The safe thing on which to stand in order to reach something otherwise out of reach is a strong stepladder.

The law of gravity dictates that not only do people themselves occasionally fall when they lose their balance or their perch but also that things will fall on them if not kept from doing so. Many people have been injured in the home by falling objects such as heavy books, dishes, jars of fruit, cans of vegetables, kettles, frying pans, and other common household articles.

Tidiness and forethought will prevent accidents of this kind. Objects properly arranged on shelves and in cupboards are much easier to find and are not likely to fall if accidentally disturbed. Articles jumbled together into a space too small to hold them sometimes fall or cause other objects to fall when they are being removed. Even if no one is hurt in an accident of this kind, a valuable article may be broken or a mess made that is hard to clean up.

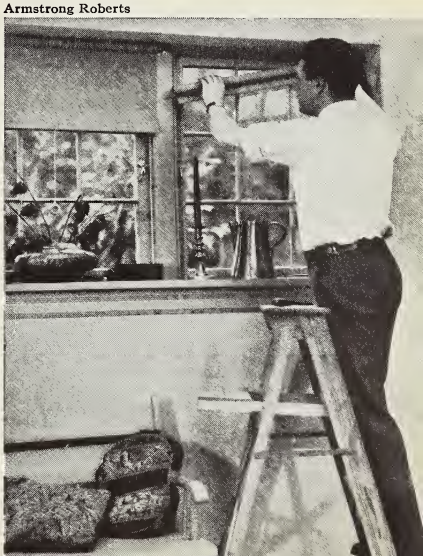
FIRST AID FOR BROKEN BONES

A bad fall may result in a broken bone. This injury is called a fracture. When the bone is completely broken apart but the skin is not injured, the break is called a simple fracture. If one or both of the splintered ends of a broken bone pushes up through the flesh and skin, the break is called a compound fracture.

Usually it is possible to tell whether a bone has been fractured, or broken. It is quite likely that the injured person has felt or heard the bone snap. There is pain and swelling at the break and the pain becomes more severe if movement is attempted. Do not handle or move the limb to find out whether the bone is broken. The first thing to do is to call a doctor. Until the doctor comes the victim of the accident must lie perfectly still. If he tries to move or someone moves him carelessly, the broken ends of the bone may cut through the skin and cause a compound fracture. It is especially important not to move a person who complains of great pain or a feeling of numbness or tingling in the back and legs. The spine may be broken and any movement may cause injury to the delicate spinal cord.

If it is necessary to move a person who has broken an arm or leg, the broken ends of the bone must be held immovable

Armstrong Roberts



This man believes in being safe at home as well as safe at work

Eastman Kodak Company

An X-ray picture of fractured leg bones

by a splint. Any handy stick that is strong and straight will serve. Tie the splint to the broken limb firmly but gently with strips of cloth. Do not tie the strips so tightly that the flow of blood in the limb is cut off. The ends of the splint should reach beyond the joints above and below the break. For example, a splint for a broken forearm should reach from above the elbow to below the wrist. When the doctor comes he will remove this temporary splint to set the bone and will then put on a permanent splint to hold the ends of the bone together until healing has taken place. When the doctor sets the bone he brings the two broken ends as close together as possible. Usually he takes an X-ray picture of the bone to make sure that it is set properly.

It is necessary to give a broken limb complete rest. If it is moved the new bone forming in the fracture will be broken up, just as new ice forming over a pool is broken up if the water is disturbed.

Sprains, Strains, and Bruises

When the ligaments surrounding a joint are stretched suddenly or torn, a sprain is the result. There is pain and swelling, and the skin usually turns black and blue. A doctor should be called for a sprain unless it is very slight. The joint should be bandaged firmly so that the injured part cannot easily be moved. To relieve the pain hot cloths may

be applied. A sprained wrist or ankle may be put in a basin of hot water several times a day. The water should be kept as hot as the injured person can stand. A severe sprain requires a long period of rest. If a person whose ankle has been sprained tries to walk too soon the joint may always be weak and painful.

A strain is an injury to the muscles instead of to the ligaments. Rest, the application of hot water, and light rubbing are helpful in relieving the pain of a strain.

A bruise usually is caused by a fall or a blow. There is no break in the outside surface of the skin, but the capillaries in the lower layers are broken. Blood escaping from the injured capillaries and clotting in the skin tissues gives the black-and-blue appearance that we associate with a black eye or some other form of bruise. Cloth pads wrung out of cold water or cooled by placing on ice help to relieve the pain and swelling of a bruise.

PREVENTING ACCIDENTS CAUSED BY FIRE

Look at your watch or a clock for just one minute. During that minute a conflagration has broken out somewhere. The total loss by property damage from fire each year amounts to millions of dollars, and thousands of people lose their lives or are made homeless, for most fires occur in homes.

Here are some fire-prevention rules which all good homemakers should know and follow:

Have the soot cleaned out of stovepipes and chimneys from time to time, and repair all loose stovepipe joints and bad flues.

Shovel hot ashes from the furnace, stove, or fireplace into a metal container.

Burn paper and rubbish in a covered wire basket or incinerator.

Never hang curtains, towels, and other inflammable material near stoves, lamps, gas jets, or any open flame.

Use small electric-light bulbs on a Christmas tree instead of candles.

Make sure that matches and cigarettes and cigars are put out before they are thrown away.

Do not allow rubbish, oily or greasy rags, or stacks of old newspapers to accumulate. Spontaneous combustion may take place in such material.

Everyone should know what to do in case of fire. You have fire drills in school so that your response to a fire alarm is automatic. It is a good idea, also, to have fire drills in the home so that each member of the family will know how to escape from the building in case fire breaks out either in the daytime or at night. The first thing to do in case of fire is to send in an alarm to the fire department either by telephone or by running to the fire-alarm box nearest the home. Every home should have a fire-extinguisher and every person should know where it is kept and how to use it.

Remember that fire must have air in order to burn. Immediately close all doors and windows in a room where fire has broken out. If the fire is small and you can get near it, try to put it out by using a fire-extinguisher, water, blankets, or rugs. Do not use water on a fire caused by oil or gasoline, as the water will only scatter the flames. If your clothing catches fire, lie down and roll. Do not run. If you ever have occasion to escape from a burning building, remember that the air nearest the floor is usually the freest of smoke. Crawl out; do not walk. A damp towel or napkin held over the mouth and nose helps to strain the smoke. It is a good idea also to learn how to climb down a rope. In some schools boys and girls learn how to do this in the gymnasium. In case people are trapped in an upper

story of a burning home, a serviceable rope can be made by knotting bed sheets together and tying them firmly to a bedpost.

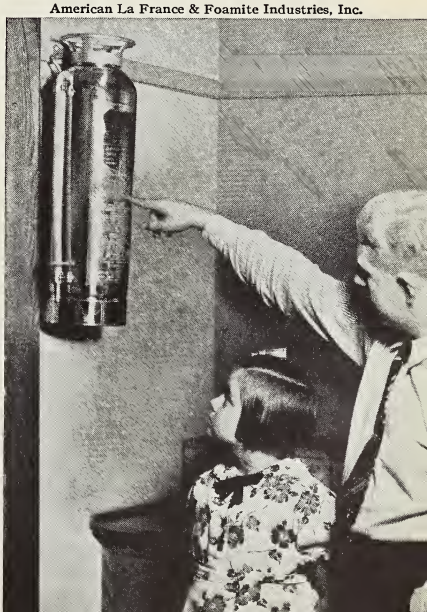
Burns and scalds are second in importance to falls as a cause of home accidents. According to the records several thousand deaths from burns and from conflagrations occur every year. It is estimated that nearly three fourths of all fatal burns occur in home accidents.

While falls are most common among old people, and are due in large measure to the infirmities of age, burns and scalds are most common among children and are largely due to the carelessness of adults and older boys and girls. Playing with matches left carelessly within reach of their prying fingers and playing about bonfires or near stoves or fireplaces are two of the chief causes of burns among little children. Most fatal scalds are caused by pulling over a pan, kettle, pot, or dish containing a hot liquid, or by falling into a tub, bucket, pail, or boiler full of hot water.

First Aid for Burns and Scalds

Burns are classified according to the degree, or depth, to which the body tissues are injured. A first-degree burn is one in which the skin is reddened. A second-degree burn is one in which the

American La France & Foamite Industries, Inc.



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Everyone in the home ought to know where the fire-extinguisher is located

skin is blistered. A third-degree burn is one in which there is destruction of the tissues for some depth. The flesh is actually charred or cooked. Any burn is very painful and may be serious if a large portion of the body surface is involved. Deep or extensive burns should always be treated by a physician.

For a small first-degree burn in which the skin is merely reddened, a compress wet with a solution of baking soda in water or a compress soaked in a weak tannic-acid solution and covered with a bandage makes a good dressing. The dressing should be kept moist. Tannic-acid solution is made by dissolving five teaspoonfuls of tannic-acid powder in a glass of warm water. In an emergency, strong tea may be used. To relieve the pain from a first-degree burn, vaseline, tannic-acid jelly, or any clean oil or ointment may be used before applying the dressing. For second-degree or third-degree burns call a physician.

Do not put a dry bandage or any greasy substance on raw sensitive burns. The removal of anything which cannot be removed easily before a permanent dressing is put on by the doctor will cause the patient great pain. If clothing sticks to the burned place, do not try to pull it off. Leave this for the doctor to do.

Chemical burns are caused by acids, such as carbolic acid, or by alkalies, such as lye. The first-aid treatment for a chemical burn is to wash it *immediately and continuously with large quantities of water.* Then treat it in the same way as any other burn.

Powder burns from exploding firecrackers, from blank-cartridge pistols, or from fireworks or firearms of any kind should always be treated by a physician, as there is danger of tetanus from this kind of injury.

PREVENTING ASPHYXIATION

Asphyxiation is caused either by the cutting off of the oxygen supply of the body because the person cannot breathe or by the breathing in of air which contains a poisonous gas. An asphyxiated person appears to be lifeless because he has stopped breathing. No one can stay alive for more than eight minutes in this condition. Four common causes of asphyxiation are electric shock, drowning, gas poisoning, and choking.

To prevent fires and electric shock care and intelligence are needed in handling the many electrical appliances which have added so much to the comfort and convenience of our homes. The manufacturers of such equipment have spent much time and money in making it safe for home use. Electric irons, toasters, heating pads, washing machines, and similar appliances are equipped with regulators and other devices which make them accident-proof when ordinary care is used. *Read the directions and follow them carefully* is good advice which every member of the family should take seriously.

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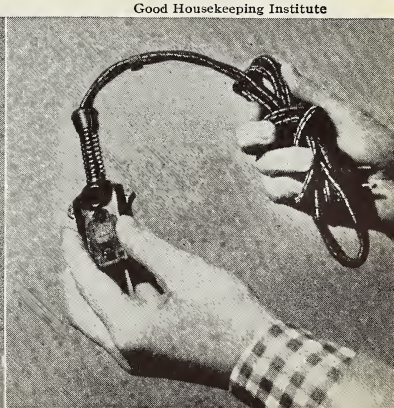
Why is it important to replace a worn-out electric cord with a new one?

Good Housekeeping Institute



Defects in electrical equipment should be repaired only by an employee of the electric-light company or some other competent electrician. Worn-out cords should be replaced immediately in order to prevent short circuits. Always disconnect electric irons, toasters, percolators, and similar appliances on leaving a room by pulling the plug from the floor or wall socket.

One receives an electric shock if a current passes through his body from a conductor of electricity. The conductor may be a live wire or rail or a faulty electric fixture. Water is a good conductor of electricity. For this reason no electrical appliance of any description, including buttons or cords for turning electric light on or off, should ever be touched with wet hands or with a damp cloth held in the hand or while in a wet bathing suit.

To rescue a victim of electric shock, contact must at once be broken between the victim and the electrical conductor. Until this is done do not touch the victim with your bare hand, as you in turn will suffer from shock. Your hands must be protected with something that is a nonconductor of electricity. Dry leather, wool, wood, and paper are good nonconductors. Dry leather gloves, a pocketbook held open, or several thicknesses of dry wool cloth or newspaper may be used to protect the hands in dragging the victim from the electrical conductor. Or the live wire or other conductor may be removed from the victim by using a dry wooden stick. After the rescue artificial respiration must be started at once if the victim has stopped breathing (see page 241).

Gas Poisoning

Another common cause of asphyxiation is gas poisoning. It sometimes happens that food cooking in a pot or pan on a gas stove boils over and puts out the gas flame. If no one

is in the kitchen, the fact that gas is escaping may not be noticed, and people in other parts of the house, especially if they are asleep with the windows closed, may be overcome by the fumes.

Here are some good rules for the safe use of gas. Perhaps you can think of others.

Never leave a gas stove unattended when the gas is burning.

Teach small children to stay away from the gas stove. When they are old enough to understand, explain why it is dangerous to touch the burner cocks.

Always keep a window open in a room where gas is burning.

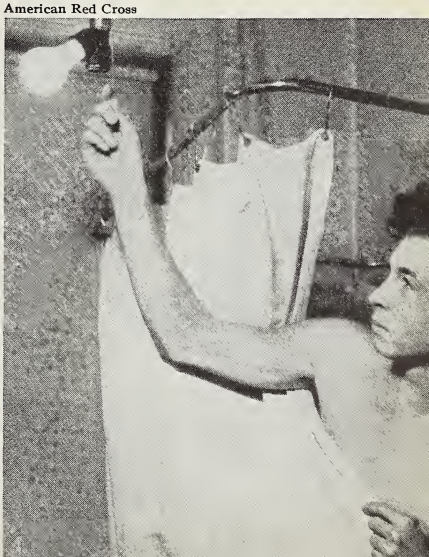
Keep the gas stove clean.

Have all gas appliances, such as the gas stove, gas pipes, and fixtures, repaired only by a trained man from the gas company.

The most deadly gas to guard against in the home is carbon monoxide. The dangerous thing about this gas is that it has no odor. Two per cent of carbon monoxide mixed with ordinary air is poisonous; 4 per cent is fatal. Carbon monoxide strikes swiftly and silently, and many persons are killed by it each year. It develops when common fuels such as coal, wood, gasoline, and gas do not burn completely.

If you have a gas stove in your home it should be provided with a vent or flue to carry

American Red Cross



Why is this a dangerous thing to do?

away fumes which might possibly develop if the burners are not properly adjusted. Gas stoves, gas furnaces, and gas water heaters should be cleaned and inspected at regular intervals by someone from the gas company to make sure they are in good condition.

About 15 per cent of the gas discharged through an automobile exhaust pipe is carbon monoxide. This is why the air in a closed garage can be poisoned so quickly when an automobile engine is running. It is very important to make sure that the garage doors are wide open before starting an automobile and before turning off the motor when the car is returned to the garage. Every year many people die of carbon-monoxide poisoning because they did not follow this rule. If you should happen to be in an automobile with

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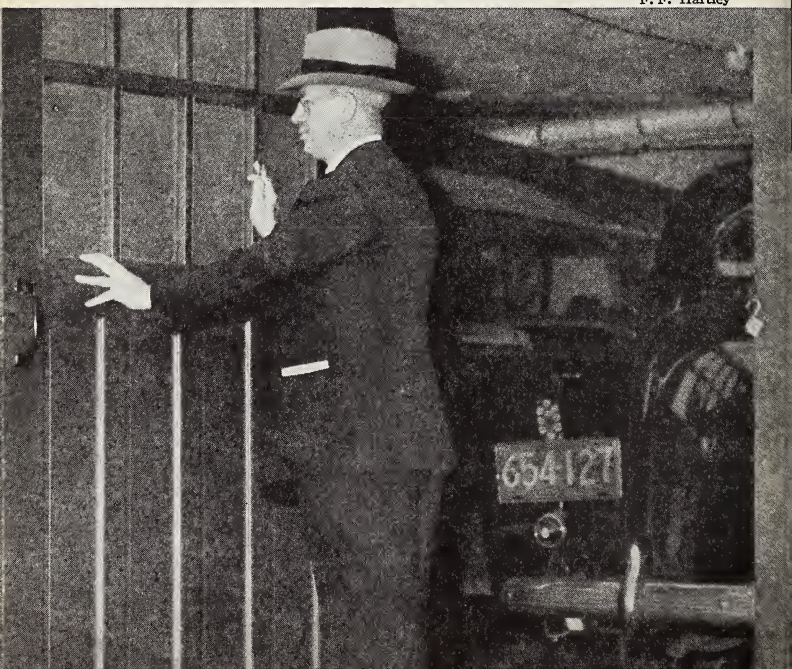
The safe thing to do before starting an automobile. Why?

F. F. Hartley



an older person who forgets to observe this important safety precaution, you may offer to open the garage doors as a courteous reminder.

If it is ever necessary for you to rescue a person from a gas-filled room or garage, tie a wet cloth over your mouth and nose before entering. *But do not rely on this.* Fasten a rope around your waist and have someone on the outside hold the other end to drag you out in case you fall. When a victim of gas poisoning has been rescued he must be given artificial respiration immediately if he has stopped breathing (see page 241).

Choking

Little children have a habit of putting into their mouths almost anything small enough to pass their lips. Older boys and girls can protect babies and small children from accidents caused by choking on small objects, such as marbles, pebbles, and coins, by keeping such things out of children's reach.

To rescue a person who is choking because something is lodged in the throat, pass your finger into the throat and hook your finger around the object in order to remove it. When a small object such as a marble or hard candy becomes lodged at the entrance to the windpipe where it cannot be reached, it may sometimes be dislodged by slapping the victim vigorously on the back between the shoulder-blades. The victim may help by lying on his abdomen across a bed or chair with his head hanging over the side. Small children may be held upside down by the heels and shaken. If these measures do not work, get a doctor as quickly as possible. Artificial respiration must be started at once in case breathing has stopped after the object has been removed.

Immediately after rescue, steps must be taken to force air into and out of the lungs of an asphyxiated person until normal breathing is restored. If there is someone to go for help, tell him to ask the nearest police department or fire department or hospital to send an inhalator. An inhalator is a device for giving oxygen. But let nothing delay you in starting artificial respiration. The method commonly used is called the prone-pressure method.

Turn the victim over on his stomach on the ground. Extend one arm above his head. Turn his face to one side so that his nose and mouth are free for breathing, as on the opposite page.

Repeat the two movements—pressing and letting go—at the rate of your own natural breathing, that is about fifteen times a minute or once every four seconds. Pushing up against the lower ribs forces air out of the lungs and when the pressure is removed fresh air rushes into the empty air sacs.

Continue artificial respiration *without interruption* until the patient breathes naturally or until a physician says the patient is dead. When natural breathing has been restored, the patient must be kept quiet and warm. He should be given hot stimulating drinks after he has recovered consciousness.

PREVENTING CHEMICAL POISONING

More than one fourth of the deaths caused by chemical poisons are caused by the mistaken use of poisonous drugs or overdoses of certain medicines. It is a good idea to have a shelf high up in the medicine cabinet reserved for bottles or boxes containing poisonous

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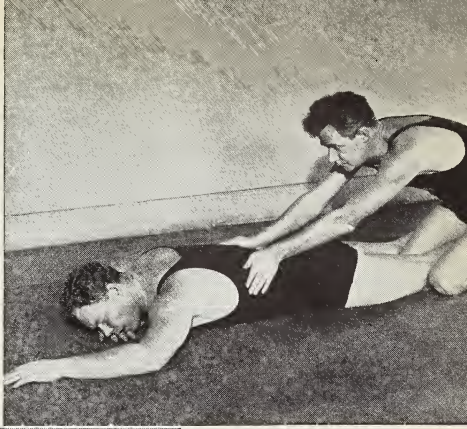
The prone-pressure method of artificial respiration

POSITION 1

AT RIGHT

Kneel with one knee between the victim's knees. Then lean forward and place your hands on the small of his back at the lower edge of the ribs



POSITION 2

AT LEFT

With your arms held straight, sway forward and bring the weight of your body upon your hands. As you are doing this, slowly count "One, two." The movement should be an upward shove or squeeze

POSITION 3

AT RIGHT

Straighten up again, removing the pressure, and as you do so count "One, two" at the same rate

drugs. Make sure that all such boxes and bottles are labeled plainly and tie tiny bells on them which will sound an added warning. Look at the label twice before giving or taking any medicine. Always turn on the light and inspect the bottle label before taking or giving a medicine at night. All household cleaning materials and disinfectants which contain poisonous substances should be labeled poison and kept on a high shelf or in a locked closet where children cannot find them.

If a person has swallowed a poison, immediate action is demanded. Call a doctor at once, and if you know what poison has been taken, tell him. Then, while waiting for the doctor to come, start at once to give first aid.

It is not necessary to learn a long list of antidotes for poisons, but remember that, in general, acids are antidotes for alkalies and alkalies are antidotes for acids. Alkalies available in the home are baking soda and soapsuds. Acids available are vinegar and lemon juice. Alcohol is the antidote for carbolic acid. Starch water is the antidote for iodine. Usually the antidote is printed on the label of any bottle or box containing a poison. Make a list of any poisonous substances kept in the home. Under the name of each substance write the antidote, and paste the list on the inside of the first-aid cabinet door.

American Red Cross

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Why is it necessary to place poisonous substances where children cannot possibly get at them?

The first thing to do when a person has taken poison is to cause vomiting. Something that causes vomiting is called an emetic. The best and safest emetic is lukewarm water taken in very large amounts. This washes out the stomach almost as well as a stomach pump and causes vomiting without too great strain. Large quantities of water also dilute the poison, and a poison greatly diluted is not likely to cause so much harm as poison in concentrated form. Remember that large amounts of water must be forced down. A little grease, mustard, or salt added to the water makes it more nauseating, but if the patient will drink quantities of plain warm water this usually is not necessary. Sirup of ipecac in teaspoonful doses also is a safe emetic, but this must be used *in addition to* and not *instead of* large quantities of water—quarts if necessary.

When the stomach is well washed out, the specific antidote should be given if this is known and is at hand, and then something should be given to soothe the irritated surfaces of the throat and stomach. Soothing substances usually available are milk, white of egg, and starch water. If the doctor has not arrived by this time and the patient seems very weak, a stimulant such as hot black coffee or aromatic spirits of ammonia in hot water should be given. Keep the patient warm.

PREVENTING AND TREATING WOUNDS

Cuts and scratches are usually caused either because a person encounters something sharp or jagged where it ought not to be or because he is handling sharp-pointed or sharp-edged instruments carelessly or unskillfully. In rummaging through a scrapbasket for a lost article a person may be cut badly if his hand encounters a piece of broken glass or crock-

ery or the jagged top of a tin can or an old razor blade. All such waste material should be placed in a special container and not with ordinary household waste.

Sometimes knives and scissors and other cutting instruments are left lying about the house or placed in drawers where other things are kept. Many people have been injured badly by sitting down on or stepping on sharp-pointed or sharp-edged tools or by encountering knives or scissors in drawers or workbaskets when they were looking for something else. Special places should be set aside for all tools, and the tools should always be returned to their places after use. Instruments such as scissors and paper-cutters, that are kept in desks or workbaskets, should have sheaths.

How to Stop Bleeding from Wounds

If bleeding from a wound is severe it must be stopped as quickly as possible or death may result. It is essential to know whether the bleeding is caused by a cut artery or a cut vein. If an artery has been cut, the blood flows out in quick spurts. If a vein has been cut, the blood flows in a steady stream. Do you know why?

Usually it is possible to stop bleeding from an artery by pressing with the thumb or fingers on a spot where the artery crosses a bone. This is called a pressure spot. The pressure must be applied at the pressure spot that is nearest to the wound and *between* the wound and the heart. In the diagram on page 246 you will see the spots where pressure should be applied in order to stop bleeding from an artery. To stop bleeding from a vein, pressure must be made at a point on the side of the wound *away* from the heart. Sometimes, if the bleeding is not severe, it may be stopped by placing a pad of sterile gauze directly over the wound.

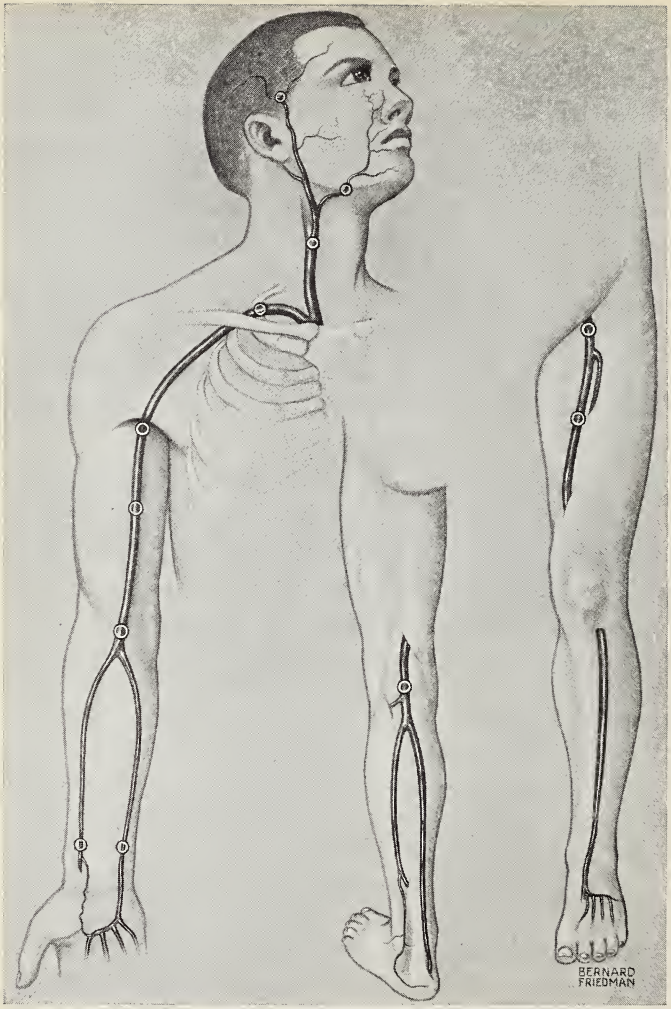
Only when pressure with the thumb or fingers or placing a compress over the wound fails to check bleeding should a tourniquet be used. To apply a tourniquet to stop bleeding from an artery, place any firm pad about the size of an egg on the pressure spot nearest to the wound between the wound and the heart (see diagram on page 246). Then tie a handkerchief, belt, strap, or any similar article over the pad, slip a small stick or pencil through the knot, and twist until the bleeding stops.

It is extremely dangerous to cut off the blood supply from any part of the body for any length of time. Many serious results, including the necessity of amputating, or cutting off, a limb, have followed the improper use of the tourniquet. Remember these rules:

1. Twist a tourniquet only hard enough to stop the bleeding.
2. Loosen the tourniquet every ten or fifteen minutes. Do not tighten it again if the bleeding has stopped but keep it in place in case the bleeding starts again.

To stop severe bleeding from wounds in places where a tourniquet cannot be applied, such as the neck, armpits, or trunk of the body, place a sterile pad or freshly laundered handkerchief over the wound and apply hand pressure over this. If sterile cloth is not available press the fingers directly over the wound and keep them there until a sterile pad can be obtained. If bleeding is controlled before the doctor's arrival, the wound should be covered with a sterile dressing.

An ordinary nosebleed usually may be stopped by pinching the nostrils firmly together for four or five minutes or by pushing a little pad of tissue paper or soft cloth under the upper lip. If these measures do not stop the bleeding in a short time, apply cloths wrung out of cold water to the back of the neck. If the bleeding is severe or continues for any length of time, a doctor should be called. While wait-



To stop bleeding from an artery, press on the pressure spot nearest to the wound and between the wound and the heart. Pressure may be applied anywhere along the artery at the front of the leg. Why?

ing for the doctor a cotton plug may be pushed gently into the nostril from which the blood is coming. After a nosebleed has been checked the clot should not be blown from the nose until all danger of a recurrence of the bleeding appears to be past.

Dressing Wounds

In general, it is best to have a physician take care of any wound which has bled severely or which has become infected or in which the skin has been much bruised, torn, or punctured. Signs of infection are redness, swelling, throbbing, pain, and the appearance of pus. However, all older boys and girls should know how to put on a clean neat surgical dressing. Great care should be taken in dressing small injuries as well as in dressing serious ones. Remember that any break in the skin no matter how small may open the way for the entrance into the body of harmful germs.

Before starting to dress a wound assemble everything you will need and then scrub your hands very thoroughly with hot water, soap, and a small handbrush and dry them on a clean towel. First wash the skin surrounding the wound, using sterile water and a sponge of sterile cotton or gauze. Wipe away from the edges of the wound to avoid washing more dirt or germs into it. Never dip the sponge into the sterile water a second time. Drop it on an open newspaper placed on the floor or table to receive waste and use a fresh piece. When the dressing is completed burn the newspaper and its contents.

Do not wash the wound itself if it has bled freely and if no dirt has been ground into it. But if the wound contains dirt, as is often the case when a child has fallen in the dirt or gravel, the dirt must be washed out. To do this flush the wound freely with sterile water from a clean pitcher,

or directly from the teakettle or pan in which the water has been boiled and then allowed to cool. Dirt that sticks in the wound may be dislodged with bits of sterile gauze or cotton. Drop each bit, after it has been used, on the newspaper.

After the wound has been thoroughly cleaned apply iodine, 3½-per-cent solution, well down into the wound and also to the skin for from one-half to one inch around the wound. Iodine should be allowed to dry before covering the wound with a dressing. Putting on a dressing when the iodine is wet may result in a severe burn. Pressing the edges of the wound gently together helps to squeeze out all the moisture possible.

To finish dressing the wound, first cover it with a sterile-gauze pad or freshly ironed cloth. Do not allow the surface of the pad which is to touch the wound to come in contact with your fingers, the table, or anything else. Bind the pad firmly over the wound with gauze or strips of clean cloth and fasten it with adhesive tape or safety pins. If the wound is small, a bit of sterile gauze may be placed over the cut and strips of adhesive used to hold the gauze in place. Do not allow the adhesive to touch the wound.

A small wound or a scratch should be squeezed gently to encourage bleeding. This helps to clean out the wound so that washing with water is unnecessary. If the wound is a mere scratch, it may be painted with iodine and left uncovered. Deep puncture wounds made by a splinter, nail, or a sharp-pointed instrument should be encouraged to bleed freely and cleaned out as well as possible with an antiseptic. The wound should then be shown to a doctor who will open and sterilize it. If the doctor thinks it advisable, he will give the injured person an injection of antitetanus serum in order to avoid the possibility of tetanus.

To remove a splinter which is not embedded deeply, first paint the skin with iodine, then sterilize the needle or other

Figures *a* and *b* show how to bandage one finger.
Figure *c* shows how to bandage two fingers.
Figure *d* shows the completion of a bandage for the whole hand

instrument to be used by boiling it in water for five minutes. Remove the splinter, squeeze the wound to make it bleed, wipe it dry with sterile gauze, and apply iodine again.

A wound made by the bite of a dog or some other animal is no more dangerous than any other wound unless the animal has a disease called rabies. Such an animal is said to be rabid, or "mad." The bite of a mad dog or some other rabid animal is extremely dangerous even if the wound is no more than a mere scratch. Rabies can be kept from developing after a mad-dog bite by the Pasteur antirabic treatment.

In case of animal bite let running water flow over the wound to wash out the animal's saliva. Then go immediately to a doctor to have the wound dressed. Tell the doctor all the circumstances of the accident, so that he can investigate. He will decide whether it is advisable to start the Pasteur treatment for protection against rabies at once or whether it is safe to wait for a report from the department of health on the biting animal.

KEEPING BABIES AND SMALL CHILDREN SAFE

Until children are old enough to understand the reasons for doing or not doing certain things, it is very important to keep dangerous objects out of reach and to keep children away from dangerous places. Play pens for the house and for the porch or yard are a necessity. Placed in one of these the baby can play safely and happily with his toys while Mother is busy. Safety gates for the head and foot of stairs are another requirement if there are small children in the home. Bars across the lower sections of windows, and strong hooks for screens will prevent falls when little people get to the climbing stage.

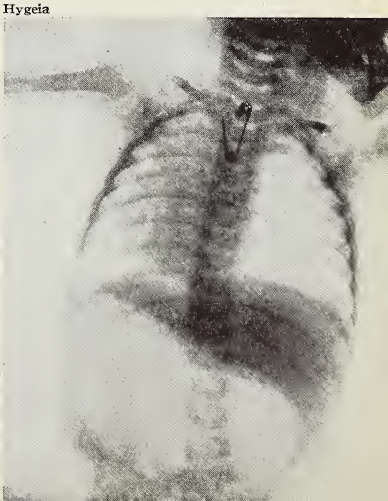
Very early in life small children should learn to be skillful and self-reliant in what they do. Telling them *not* to do things because they might get hurt will not have much effect, especially if they see other people doing what they themselves are told not to do. Skill and self-reliance are the best protection against accidents that a person can have all through life.

As soon as a child is old enough to crawl up a few steps of the stairs, he should be encouraged to come down without help. When he begins to be curious about electrical appliances and other household equipment, he should be taught their proper use.

A little child should learn to say clearly his own name, his father's name, and his address as soon as he can talk. You may make a game of this by pretending that the child is lost and that you are a stranger. "You are lost, little boy," you may say. "What is your name?" "What is your Daddy's name?" "Where do you live?" As an added precaution, a little child should wear fastened in his clothing a card giving his name, address, and telephone number.

Little children ought also to be taught how to use the telephone properly. When you are at a friend's house you may call up your home, if you have a telephone, and ask to speak with a little brother or sister. Then when the child is used to talking on the telephone you may show him how to call up Daddy or someone else.

Hygeia



An X-ray picture showing what happened when Baby got hold of a small safety pin

When you take a child for a walk or out to play, never do anything you would not like him to do. Small children learn largely by imitating others. In a pleasant conversational manner explain to the child why you cross a street only at an intersection, why you wait for the proper light signal before starting to cross and, in crossing, why you look first to the left and then, when you reach the middle of the street, to the right. In walking on a road where there is no sidewalk or footpath, explain why it is necessary to walk always on the left side. After you have repeated your instructions several times, let the child take the initiative.

"

What is Big Brother telling Little Sister about safety in roller-skating?

Coons

ARE YOU DOING YOUR BEST TO MAKE YOUR HOME SAFE?

Do you inspect all the different parts of your home frequently and correct promptly all the unsafe conditions you find?

Do you practice doing everything in a safe skillful manner and avoid actions which you know are unsafe?

Is there a fire-extinguisher in your home, and do all the older members of the family know where it is kept and how to use it?

Do you know the location of the fire-alarm box nearest your home and how to turn in an alarm?

Do you have fire drills at home?

Do you cleanse properly all cuts and scratches no matter how slight and use an antiseptic, and do you cover all wounds except minor ones with a sterile dressing?

Are you making an effort to learn and to practice the first-aid measures for severe bleeding, stoppage of breathing, poisoning, burns, fractures, choking, and other injuries?

If there is a baby or a small child in your home do you keep dangerous objects out of his reach and keep him away from dangerous places?

Are you helping to teach young children to be skillful and self-reliant and to form habits of safety?

1. Which of the following statements are true and which are false? Reword each false statement so as to make it true. (*Do not write in the book.*)

a. More than half as many persons are injured in occupational accidents as in home accidents.

b. The principal mechanical factor involved in falls is disorder.

c. Burns and scalds are most common among old people.

d. In case one's clothing catches fire the best thing to do is to run for help.

e. In disconnecting an electric toaster, the plug should be pulled from the toaster socket.

f. One should never turn an electric light on or off when the hands are wet.

g. A gas stove should not be left unattended when a burner is lit.

h. About 15 per cent of the gas discharged through an automobile exhaust pipe is carbon dioxide.

i. To be on the safe side, always stop and look at the label twice before taking any medicine.

j. "Do as I *say*, and not as I *do*" is a good safety slogan for an older person to use in teaching little children safe practices.

2. Choose the best ending for each of the following sentences. (*Do not write in the book.*)

a. If a person has stopped breathing as a result of drowning, electric shock, gas poisoning, or choking, nothing whatever must be allowed to delay · (1) giving artificial respiration · (2) running for help · (3) administering stimulants.

b. If a person has taken a poison, the thing to do *immediately after calling the doctor* is · (1) try to remember, or hunt for, information concerning the proper antidote · (2) give large quantities of lukewarm water in order to cause vomiting · (3) give something to soothe the irritated surfaces of the throat and stomach.

c. To stop bleeding from a wound in which an artery has been cut, pressure should be applied at · (1) the pressure spot which is nearest to the wound and between the wound and the heart · (2) the pressure spot which is nearest to the wound on the side away from the heart · (3) the pressure spot along the artery which is nearest to the heart.

d. When it is necessary to apply a tourniquet · (1) the tourniquet must be twisted as tightly as it is possible to twist it · (2) the tourniquet must be loosened every ten or fifteen minutes until the doctor arrives · (3) the tourniquet must not be loosened before the doctor's arrival.

e. The best substance to put on a raw sensitive burn is · (1) vaseline · (2) a solution of baking soda or tannic-acid powder in water (3) iodine.

THINK ABOUT THESE QUESTIONS

1. We do not expect accidents to happen, and this is a good thing. If we tried to avoid doing things, such as crossing a street or taking a bath, the doing of which has been the occasion of many accidents, we should at last find ourselves doing nothing at all. There are very few actions which at one time or another have not been the occasion of an accident. Since this is so, what in your opinion are some of the ways in which people may make themselves accident-proof?

2. Why is it important for boys and girls to learn how to recognize unsafe conditions in the home, even though there may be some unsafe home conditions which are now beyond their power to remedy?

3. What are some of the ways in which you may help little children to grow up into courteous, careful, law-abiding citizens?

4. What facts about the circulation of the blood are demonstrated by the symptoms of bleeding from an artery and the symptoms of bleeding from a vein?

5. Why is it important not to move a person with a broken arm or leg until a splint has been applied? Why should a person with a broken back be moved *only* under the supervision of a doctor?

6. Why are restoration of breathing in a person who has stopped breathing, the control of severe bleeding, and inducing vomiting in a person who has taken poison first-aid measures which demand immediate application?

DO THESE THINGS

1. Accidents happen usually because some thing is at fault (mechanical factor) or because some individual is at fault (personal factor) or because both are at fault. Each time an accident happens in your home, no matter how slight, make a study of it. Then write a report which tells the type, or nature, of the accident, what the injured person was doing at the time of the accident, what mechanical factor, if any, was involved; what personal factor, if any, was involved; and finally how the accident could have been prevented. The collection of such reports may be made a class activity and a discussion of them a part of the safety-education program of the class.

2. As a class activity collect newspaper stories about accidents which occur in your community. From the story try to make reports similar to the one outlined in project 1 and discuss the reports in class.

3. Visit a department store and make a list of toys for young children offered for sale. Mark with a star those you consider safe. Be prepared to tell in class why you think they are safe.

4. Make a survey of your home. For each part of the home (kitchen, bathroom, stairs, hallway, etc.) draw up a list of the measures that should be taken to make that part of the home safe. Make a list of various safety devices that your home needs, such as a bath mat, a fire screen, etc. Can you think of any way in which you might earn the money to buy such articles? Would one of them make a good Christmas or birthday gift for your father or mother?

5. Divide the class into groups of three or four individuals. Write on separate slips of paper the emergencies listed below. Let a representative of each group draw one of the slips. Each group must then become thoroughly familiar with the necessary action to take in dealing with the emergency written on the slip and give a demonstration of the correct procedure to the rest of the class.

a. Severe bleeding from an artery in the arm or leg (locate the correct pressure point; demonstrate use of a tourniquet).

b. Gas poisoning (demonstrate rescue).

c. Electric shock (demonstrate rescue).

d. Stoppage of breathing (demonstrate artificial respiration).

e. Poisoning caused by swallowing a poisonous substance (name the poison; demonstrate first-aid measures).

f. Broken arm or leg (demonstrate applying a splint).

g. Shock (demonstrate symptoms and first-aid measures).

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

occupational accident
hazard
disorder
involve
personal factor
mechanical factor
simple fracture
infirmities
first-degree burn
second-degree burn
third-degree burn
tannic-acid solution
asphyxiation
inhalator
carbon-monoxide gas
prone-pressure method of artificial respiration
emetic
nauseating
sirup of ipecac
tourniquet
amputate
recurrence
rabid
Pasteur antirabic treatment
initiative

2. From the list above choose the word or term with which you associate each one of the following phrases:

a burn in which the skin is reddened
a way of restoring breathing after it has stopped
a burn in which the flesh is charred or cooked
a burn in which the skin is blistered
method of preventing the development of rabies after a mad-dog bite
a nauseating medicine
a condition caused by cutting off the oxygen supply of the body
something to cause vomiting
a source of danger
cut off a limb

UNIT X

Working Together for Health and Safety

Very few people live by themselves. Even in rural districts where homes are scattered people live and work and play together. To be a member of a group brings many privileges, but it also brings many responsibilities. This is particularly true of the control of disease. To a certain extent we may say that health is a personal matter. But so many factors in the home and community enter into the problem of keeping well that we must work together in dealing with them. This means that each individual is responsible for helping to protect the health and safety of others.

For boys and girls this responsibility extends principally to those with whom they come in actual contact whether at home or in school or on the streets. But young people who are old enough to manage their own homes and to vote are responsible for supporting the machinery set up for protecting the health and safety of the home and the community.

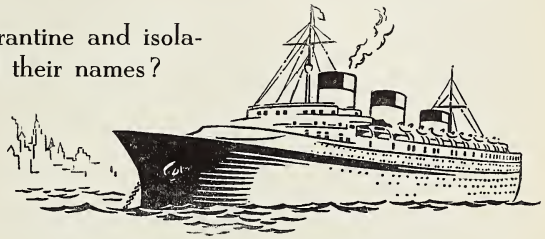
Not only are individuals responsible for their relationships with others, but also they are responsible for the management of their own lives. Learning to work and play fairly with all sorts of people, dealing honestly with each situation as it arises, and finding interesting things to do in their leisure time are ways in which boys and girls may prepare themselves to manage their lives with wisdom.

DO YOU KNOW

The name of the first city in America to have a permanent board of health?

The only scientific measures taken to check the spread of communicable disease up to the nineteenth century?

How quarantine and isolation got their names?



What is meant by the "incubation period" of a disease?

The name of the first city in the world to have a fully equipped health-department laboratory?

Some of the ways in which boys and girls may practice mental hygiene?

What is meant by vital statistics?

How to figure the birth rate and the death rate of a community?

What is meant by the expectation of life at birth and how much this has increased since 1901?

The machinery set up in a community for guarding the health of individual citizens is usually called the department of health or the board of health. The first boards of health in America were founded as a result of severe epidemics of yellow fever which visited cities as far north as Boston. When yellow fever devastated Philadelphia in the great epidemic of 1793, the local physicians, who thought it was caused by filth in the streets and on the docks, persuaded the citizens to establish a permanent board of health. They also persuaded the town to clean its streets and to build one of the first public water-supply systems in the country. Although Dr. Benjamin Rush and the other doctors were wrong as to the cause of yellow fever, their mistaken ideas were very helpful in promoting community improvements.

The same thing happened in Boston. A board of health was founded there after a yellow-fever epidemic in 1798. The early records of the board are filled with many references to scavengers, the care of hogs, and other matters relating to the cleaning up of the town. Getting rid of insanitary conditions is still a very important part of the work of all departments of health.

In 1848–1849 a great cholera epidemic which swept the United States and Canada awakened the citizens to the necessity for fighting diseases co-operatively. The movement for departments of health spread rapidly. They are found today in most localities. In small communities an official called the health officer may have charge of all matters pertaining to the public health. Modern departments of health differ widely in membership and powers, but the chief concern of all of them is the control of preventable disease.

" In the city of Venice six hundred years ago the word *quarantine* was invented "

Quarantine and Isolation

Hundreds of years ago no one even dreamed that a large many-celled organism, such as a man or an ox, might be killed by a one-celled organism so small that it could not be seen by the naked eye. However, certain groups of people recognized that certain diseases are communicable. The ancient Hebrews used the term *unclean* to describe a person sick with a communicable disease. Their priests controlled such diseases by enforcing the rules of quarantine and isolation laid down by Moses.

All through the Middle Ages, quarantine and isolation as developed in the sanitary code, or health laws, of the Old Testament were the only scientific means adopted to check the spread of epidemics. In the fourteenth century, when the dreaded Black Death was spreading rapidly, the citizens of Venice, Italy, thought that the disease was brought to their city by people landing from ships. "Let us pass a law that will forbid a ship to land its passengers until it has been in the harbor for forty days," said the citizens. "By that time we shall know whether any passengers on the ship who have been exposed to the Black Death will come down with it. In this way we can keep people from bringing the Black Death into our city."

Alas for the citizens of Venice! Their law did not mention the ship's passengers that really spread the plague. These passengers were the rats that ran freely from the ships along the ropes by which the vessels were moored to the shore. But even though the citizens of Venice did not keep the Black Death out of their city, they had invented the word *quarantine*. The Italian word for forty is *quarantina*. Thus the act of limiting the freedom of movement of people who have been exposed to a dangerous communicable disease came to be called quarantine.

Isolation is different from quarantine in that it means keeping a person actually sick with a communicable disease away from well people under conditions that will prevent the spread of the germs that cause the disease. In the old days when there were no steamboats or motorboats or telephones or radios, an island was thought of as a place out of touch with the rest of the world. The Italian word for island is *isola*, from the Latin word *insula*. Therefore shutting off a sick person from the rest of the world as if he were an island was given the name *isolation*.

Modern Methods of Isolation

Up to about fifty years ago boards of health were concerned chiefly with the control of communicable disease by quarantine and isolation measures and by the removal of insanitary conditions. But these ancient measures were not very satisfactory in controlling an epidemic disease until its cause and the manner of its spread became known.

Isolation took on new importance as soon as it became known that every infected person, animal, or insect, whether actually sick or a carrier of disease germs, is a focus from which invisible germs may spread outward to hundreds of other people. It is safe to say that communicable diseases would disappear if each sick person and each person who is a carrier of disease germs could be completely isolated at the very instant the germs entered his body. This is why our laws require that every case of communicable disease must be reported to the health department of a community without delay. The health department generally has a list of diseases which must be reported. These diseases are called reportable diseases. Sometimes a family, not wishing to have a quarantine sign on the door, may urge a doctor not to report. Good citizens will not do this, especially if they

realize that a single unisolated case may cause the suffering and even death of hundreds of other people.

As soon as a case of communicable disease is reported it is the duty of the health department to see that the patient is properly isolated. A representative of the department visits the family and places a warning sign on the door of the house, apartment, or room. In many progressive communities the representative sent by the health department is a public-health nurse, who gives the family a clear de-

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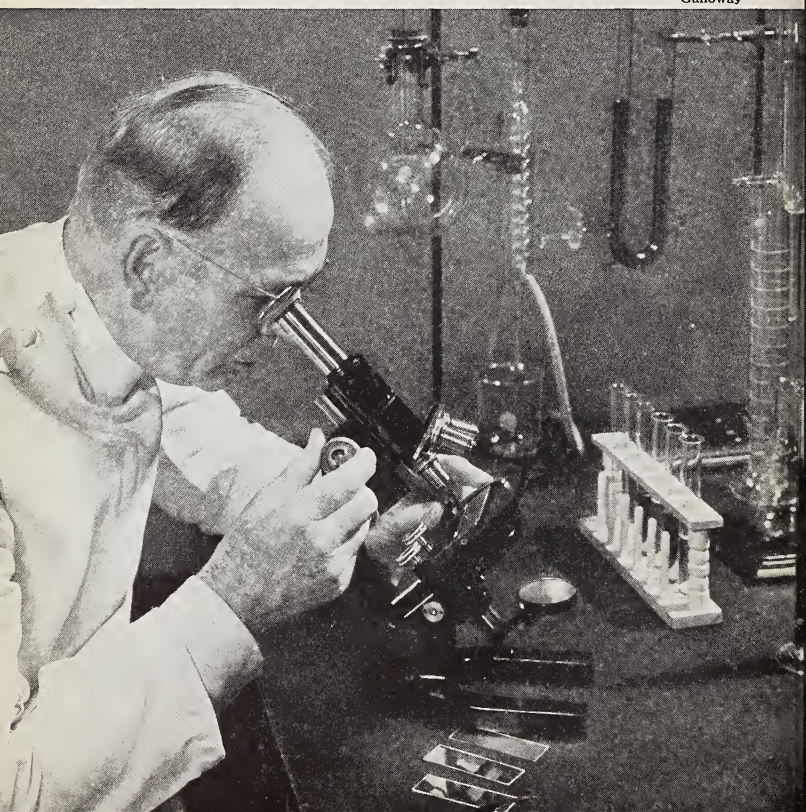
In a health-department laboratory.
Searching for the germs that are making someone ill

Galloway



tailed plan of nursing care for the patient and explains what must be done to protect the other members of the family. If it is impossible to secure effective nursing and complete isolation in a home, it may be necessary to send the patient to a hospital equipped to handle communicable-disease cases.

At the close of the isolation period it is the duty of the health department to make sure that the patient's room and furniture are thoroughly disinfected. For most diseases washing with soap and water and exposure to sunlight are considered to be sufficient. Fumigation, which was once thought necessary, is now seldom used except in insect-borne diseases, such as malaria and yellow fever.

In most cities and large towns the health department has a laboratory which gives the private physician invaluable help in diagnosing cases of communicable disease. By making laboratory tests of body discharges it is often possible to find out what germs are making a person ill. Cases of diphtheria, typhoid fever, and various types of pneumonia are often identified by laboratory tests. New York was the first city in the world to have a fully equipped health-department laboratory. It was founded in 1892 by Dr. Hermann Biggs when a cholera epidemic threatened the city. Today such laboratories are found nearly everywhere, giving physicians exact knowledge as to the particular germs with which their patients are infected and making it possible for the health officer to discover and to isolate well people who are carriers of disease germs.

Modern Methods of Quarantine

Unfortunately many communicable diseases are most catching in their very early stages. Often the earliest symptoms are those of the common cold, and little attention is

paid to them until more definite symptoms appear. By that time other people may have been infected. This is why it is important to discover "contacts" when a case of communicable disease has been reported to the health department. A contact is a person or animal who has been near enough to an infected person or animal to have caught the infection either directly by breathing in the germs or indirectly by handling articles which have been freshly soiled with infected body discharges.

The measure taken to control contacts is quarantine. The contact is kept in quarantine; that is, his freedom of movement is limited for a period of time equal to the longest incubation period of the disease to which he has been exposed. By incubation period is meant the time which goes by between the entrance of the germs into the body and the

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Dr. Jean Broadhurst, a famous scientist, explaining how sneezing spreads the virus which causes measles

Black Star

time when they have multiplied to such an extent that they cause the first actual symptoms of the disease.

Each city or state sets down in its sanitary code what the quarantine period for a contact will be for each reportable communicable disease. During an epidemic of a communicable disease, when it is impossible to discover all contacts, daily or twice daily medical inspection of children in schools is a valuable means of detecting early signs of infection.

The Health of Children

Thirty years ago, more or less, public responsibility for the health of babies and little children was a thing unheard of. Since that time most progressive communities have started infant-welfare stations or well-baby clinics or health centers where babies may be protected against diphtheria and smallpox and where mothers and older children trusted with the care of babies are taught the principles of infant care.

The medical inspection of children in school, which was started during the latter part of the nineteenth century, was the first thing done in America to make health protection a part of the school program. Then about twenty years ago the great movement which we know today as "health education" began. Its object is to make school children *want* to be healthy and to give them the knowledge that will help them to develop good health habits.

Today health education is not confined to the schools. Health departments and all other organizations that are interested in preventing sickness and in prolonging life are doing their best to tell all the people about the ways in which they can use to advantage the knowledge of medical science in their daily lives.

Public-Health Nursing

At the beginning of the twentieth century the public-health nursing movement got under way in America. In many communities before that time visiting nurses were employed to take care of sick people in their homes. But when public-health authorities began to realize that the control of tuberculosis and the protection of the health of mothers and little children depended largely on education in hygiene, the need was felt for health teachers who could go into the homes and help families to learn and to practice the rules of healthful living. More than five thousand organizations in the United States and Canada now employ public-health nurses.

THE HEALTH OF THE MIND

It is only since the beginning of the twentieth century that the health of the mind, or mental hygiene, has become a science. Before that time little or no effort was made to find out why some people became insane, or "lost their minds." Long after the notion that diseases of the body are caused by demons had been given up, the idea still persisted that insane people were possessed by devils. The insane were treated very cruelly even as late as the nineteenth century.

We now think of insanity as an illness of the mind which can often be prevented or cured, just as it is often possible to prevent or to cure an illness of the body. In many communities we have mental-hygiene clinics, where doctors are helping people to adjust the behavior problems which may lead to mental illness. In hospitals for the mentally ill the patients are treated kindly and everything possible is done to find out why they are ill and to make them well.

Scientists do not know what causes many of the diseases of the mind, but, in general, they agree that serious mental troubles are most often found in people who cannot adjust themselves to the world around them. There is no human being who goes through life without having troubles and disappointments and defeats. These are real things which must be faced by everyone. It takes courage to face them. Some people try to run away from their problems by living in a world of daydreams or by cheating or lying. Such people are said to be trying to escape reality. When they cannot escape, when they see worse troubles closing in on them than the ones they were afraid to face, they may lose their mental balance.

The boys and girls who look at things exactly as they are and make the best of them are the ones who will go through life in harmony with themselves and their fellows. The boy who marches into an examination which he fears and does the best he can is practicing good mental hygiene. The girl who is able to see that she is unpopular because of some fault of her own, rather than because everyone "picks on" her, and sets out courageously to correct that fault is practicing good mental hygiene. Boys and girls who realize that getting along with all sorts of people is one of the requirements of successful living will practice mental hygiene by making every effort to get

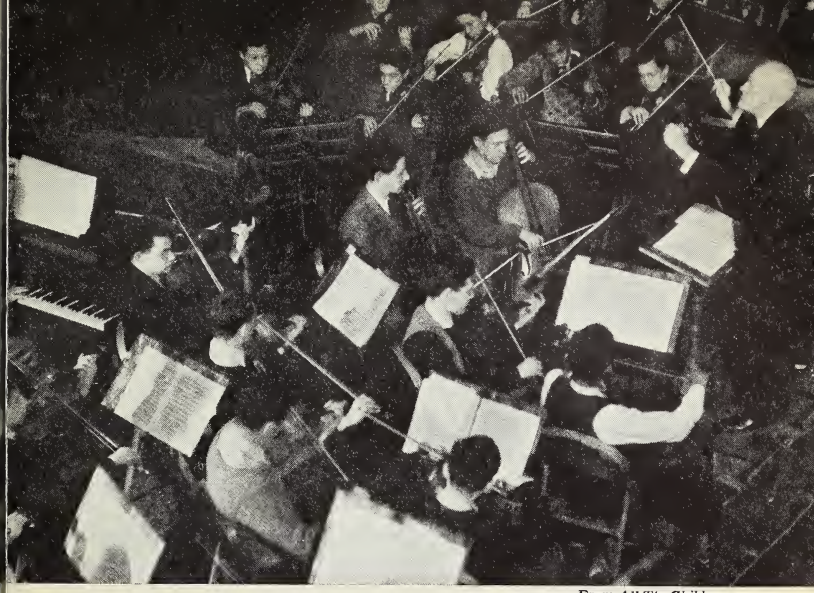
Acme

A pleasant occupation often helps to improve the outlook on life of a patient in a hospital for those who are mentally ill

along with people. They will find all sorts of people to practice getting along with at home and in school.

One of the best ways to achieve good mental health is to have interests and activities which give one an opportunity to express one's self happily and constructively. Everyone is obliged to do many things. Boys or girls have school and home duties that are required of them. Grown-up people must work to make money or to keep the home running smoothly. But not all of the day nor every day is taken up with what one *has* to do. Usually there is some time left over. This is called leisure time. It is the time that belongs to each individual alone to use as he likes. During this time it is possible to cultivate the tastes that will give one a great deal of pleasure all through life.

Some people have hobbies which they pursue in their leisure time. A hobby may turn out to be a lifework. From early boyhood Clarence W. White of North Bennington, Vermont, liked to make things out of wood. One day when he was grown up, he made a three-wheeled play car for his young son Freddy. The neighbors liked it so much that they asked him to make play cars for their children. Mrs. White said to her husband, "I think you have something that will sell." So Mr. White made a nicely finished sample play car which he showed to a New York toy-buyer. The buyer placed an order for a dozen. This is how the first "kiddie-car" came on the market. Mr. White's boyhood hobby led to fame and fortune. Many other men and women have found that the things which they thought of only as pleasant pastimes later became full-time jobs.

Do you have a hobby? Do you like to make things, collect things, write stories, draw pictures, take photographs, or play a musical instrument in your spare time? If there is anything you like doing better than anything else you can think of, and if you give yourself time to do it, you are

From *All The Children*

The ability to play a musical instrument gives many people great pleasure all through life

well started on the way toward good mental health. A healthy mind in a healthy body should be the aim of every boy and girl.

VITAL STATISTICS

Healthy happy men, women, and children make up the true wealth of a community. How are we to tell whether the health program of a community is making the citizens healthier year by year? Vital statistics furnish the yardstick for measuring the people's health. Statistics are facts told in figures. Vital statistics are facts about people told in figures. Records of the number of people in a community, their age and sex, the marriages, births, deaths, and sick-

nesses which take place among them, are all records of vital statistics. These records are used in many different ways.

Most civilized nations make a count of the population at regular periods. This is called taking a census. In addition to knowing how many people there are in a nation or in a community, it is important to have the three greatest events in their lives—birth, marriage, and death—made matters of public record.

Birth and Death Registration

The public recording of a birth is called birth registration. The information about a baby entered on his birth certificate will be of great importance to him in later life. Situations frequently arise in which it is necessary to use a birth certificate in order to prove age, parentage, and place of birth.

The public recording of a death is called death registration. The facts recorded on death certificates are extremely valuable to the health department. By knowing the cause of death of everyone who dies, health officials are able to figure out the leading causes of death. This information helps them to direct their efforts against the diseases and conditions that are the greatest enemies of human life. To know the age at which each person dies is valuable in determining whether or not more people year by year are living to a greater age.

By knowing the number of babies born and the number of people who die each year in a community, the health department is able to figure out the birth rate and the death rate of a community. The death rate is the proportion between the number of people who die in a given period and the number of people alive at the middle of that period.

The general death rate is figured very simply. For ex-

ample, if the number of deaths in a given city in 1938 was 4500 and the population of the city on July 1, 1938, was 350,000, then the general death rate of the city for 1938 was 12.8 per thousand.

$$\frac{4500}{350 \text{ (thousand)}} = 12.8 \text{ (per thousand)}$$

Death rates are also figured for special age groups and for particular diseases. To avoid too many decimals, the death rate for a particular disease is usually based on 100,000 per population instead of 1000 per population. For example, if 5 people in a midyear population of 300,000 died of typhoid fever during the year, the death rate for typhoid fever was 1.6 per hundred thousand.

$$\frac{5}{3 \text{ (hundred thousand)}} = 1.6 \text{ (per hundred thousand)}$$

The general birth rate of a community is figured in the same way as the general death rate. That is, it is the proportion between the number of babies who are born alive in a given period and the number of people alive at the middle part of that period. For example, if the number of babies born alive in a given city during 1938 was 5000 and the population of the city was 350,000 on July 1, 1938, then the birth rate was 14.3 per thousand.

$$\frac{5000}{350 \text{ (thousand)}} = 14.3 \text{ (per thousand)}$$

Before deciding to settle in a community the wise citizen finds out the birth and death rates and whether or not the community is making progress in the control of such preventable causes of death as tuberculosis, diphtheria, and accidents. A low death rate is the sign of an up-and-coming community which is using all the resources of science to protect the health and safety of its citizens.

THE RESULTS OF THE NATION-WIDE HEALTH-AND-SAFETY PROGRAM

Today the defense of the public health and safety is a vast co-operative enterprise. First, because it is closest to all the people and supported by all the people, we have the health department with its divisions of disease control, health education, vital statistics, mother and child hygiene, public sanitation, and supervision of milk supplies, water supplies, and food handling. Co-operating with health departments in the United States and Canada are various government departments and bureaus, great national organizations, such as the American Red Cross, and a vast number of state, provincial, and community organizations that play a part in the common task of protecting the health and safety of all the citizens. There are also great national foundations supported by private philanthropy which make possible important research in the causes and prevention of disease, and there are local health centers and hospitals supported by private funds. Many large industries provide health supervision for their employees.

Various activities of city governments which are not directed by the health department are helping to make life healthier and safer for the citizens. Parks, playgrounds, free band concerts, museums, art galleries, and free golf courses and tennis courts give opportunities for recreation. The work of the highway department in securing adequate street lighting and in widening and straightening streets, and the work of the police department in directing traffic and in carrying on safety campaigns are doing much to prevent accidents. Many cities have started campaigns against unnecessary noises, especially at night, since it has been proved that excessive noise may seriously affect the hearing and may interfere with sleep and efficient work.

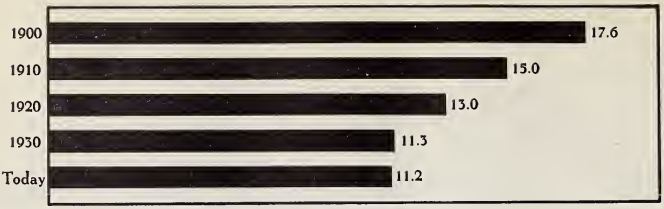
Hartley

Enjoying a game of golf on a free golf course

The Span of Life

Have you ever heard the expression "the span of life"? The unit of measurement called a span is the space over which the hand can be stretched from the end of the thumb to the tip of the little finger. How many inches can you measure with your hand? The average man can measure nine inches. Therefore a span is fixed at nine inches.

The span of life is the period over which a man's life is stretched from birth to death. No one can say how long this span will be for a particular person. It may be very short. It may be long. But it is possible to figure out the number of years that a baby born at a certain time in a certain country may be *expected* to live. This does not mean that the baby will live that long or that he will not live



This table shows the drop in the death rate in the United States per thousand population since 1900. If the death rate had been the same last year as it was in 1900, thousands of people alive today would be dead

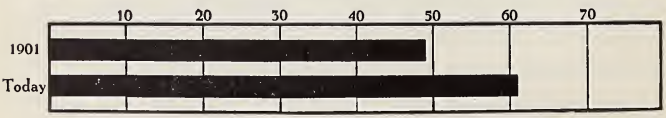
"

many years longer. It means simply what may be expected, according to the experience of the people of his own time and place. The number of years he may be expected to live is called his expectation of life at birth. Since the beginning of the twentieth century the expectation of life at birth in the United States has increased by twelve years. In 1901 a baby at birth might be expected to live for forty-nine years; a baby born today may be expected to live for at least sixty-one years.

Scientists working in their laboratories, doctors on their busy rounds, public-health officials and nurses guarding the health of the community, parents in the home, teachers in the classroom, and boys and girls everywhere who are using the discoveries of medical science in their daily lives are all helping to lengthen the average span of life. Are you doing your share?

"

The gain in years in expectation of life at birth in the United States since 1901



ARE YOU DOING YOUR BEST TO WORK WITH OTHER PEOPLE FOR HEALTH AND SAFETY?

Do you obey quarantine and isolation regulations when the health department is obliged to put them into effect?

Do you avoid crowded places and stay cheerfully at home when the health department requests you to do so during an epidemic?

Do you try to keep away from people who cough or sneeze without covering the mouth and nose?

Are you using the knowledge you have learned in school about the body and its care to develop good health habits?

Are you learning to "face reality" by doing the best you can to solve your problems instead of trying to run away from them?

Do you practice getting along with all sorts of people at home and at school and in playing group games?

Do you have a hobby or some activity which you enjoy in your leisure time?

Do you do what you can to co-operate with all the forces in your community that are working for the health and the safety of the citizens?

TRY THESE TESTS

1. Tell what you think of in connection with each one of the following terms:

reportable disease	birth registration
disease-carrier	death registration
communicable-disease contact	birth rate
incubation period	death rate
mental hygiene	span of life
vital statistics	expectation of life at birth

2. Using the following records of vital statistics for the city of Centerville last year, find the birth rate of the city per 1000 population and the death rate per 1000.

City of Centerville

Population July 1	250,000
Number of deaths	2,788
Number of births	3,012

THINK ABOUT THESE QUESTIONS

1. What are some of the things done by the health department in your community to prevent the spread of communicable disease? When there are a great many cases of scarlet fever or measles among school children in the community, what are some of the things the school nurse does to protect the well children? What are some of the ways in which the health department educates the people of your community in health matters? What are some of the ways in which each individual must depend on his own efforts to protect himself and his family and his neighbors from communicable disease?

2. The statement has been made that "public health is purchaseable." What is meant by this statement? Do you think that the taxpayers' money is well spent when it is used to engage school or town nurses? to keep the streets clean and well lighted? to inspect eating places? to inspect milk and water supplies? to maintain a health-department laboratory? Give reasons for your answers.

3. What does being a friend mean? Why should boys and girls have many friends instead of just one friend? Why should they try to cultivate happy home and school relationships?

4. What is the value of having a hobby?

5. Why is it important to investigate the health record of a town, as shown by its vital statistics, before deciding to settle in the town?

DO THESE THINGS

1. Appoint a committee of the class to visit the department (or board) of health or the health officer of the community. Have the committee find out and report to the class what the health department does to protect the health of the citizens. What is done to ensure pure milk and water? What are the rules for isolation and quarantine? What diseases are reportable? If the health department maintains a laboratory, ask to see how milk supplies are tested. Find out what the laboratory does to help the private physician to diagnose a case of diphtheria; of typhoid fever; of pneumonia; of tuberculosis. What vaccines and serums are available for free distribution to physicians and clinics?

2. The following table shows the death rate from diphtheria per 100,000 population in the United States for various years:

1910 . . 21	1925 . . 8	1935 . . 3
1915 . . 16	1930 . . 5	1938 . . 1
1920 . . 15		

The great majority of these deaths took place among children. Find out when toxin-antitoxin to protect babies from diphtheria first came into general use. Using the table above make a graph to show how the death rate from diphtheria has been lowered since 1910. What is the connection between the discovery of toxin-antitoxin as a means of preventing diphtheria and the great decrease in the number of deaths from this disease?

3. Find out from your department of health the death rate from tuberculosis for the years 1920, 1925, 1930, 1935, and

for the last year for which the death rate is available. Construct a graph showing the decline of the tuberculosis death rate for this period. Discuss in class the reasons for this decline. Write to the tuberculosis association in your community for material on tuberculosis and how to fight it.

4. Find out about the hobbies of different people who have been successful in life. Have a class hobby show and invite other classes and the parents of the students to come and see it.

5. Discuss vacation plans in class. Talk about some of the advantages of having a vacation. Decide on the things one should do *before* going on a vacation and *during* the vacation so as to avoid sickness and accidents?

WORD STUDY

1. Be sure that you know the meaning of and can pronounce correctly the following words or terms:

department (or board) of health
devastate
sanitary code
quarantine (scientific definition)
isolation (scientific definition)
reportable disease
communicable-disease contact
incubation period
infant-welfare station
well-baby clinic
mental hygiene
diagnose
constructively
cultivate
pastime
statistics
vital statistics
birth registration
death registration
death rate
birth rate
span of life
expectation of life at birth
philanthropy

2. Tell the difference between quarantine and isolation. Tell how each got its name.

3. Make three incomplete sentences each one of which can be completed by using a word or term from the list above. Exchange sentences with a classmate and complete the incomplete sentences he has made by supplying the missing words or terms.

BOOKS TO READ

ANDRESS, J. MACE, and BROWN, MAUD A. *Experiments in Health.* Ginn and Company, Boston, 1929.

Contains many experiments dealing with air, water, and food, which may be tried out at home or in the schoolroom.

ANDRESS, J. MACE, and GOLDBERGER, I. H. *The Health School on Wheels.* Ginn and Company, Boston, 1933.

The boys and girls in this story travel around in a yellow bus with their teacher to find out how their home city is kept healthy and safe and made attractive. They visit dairies, barber shops, public parks, homes, hospitals, the department of health, restaurants, and schools. They learn how to work together for the good of their city.

COLE, NORMAN B., and ERNST, CLAYTON, H. *First Aid for Boys.* D. Appleton-Century Company, New York, 1931.

This book was written chiefly for Boy Scouts, but it contains much valuable information also for girls. It contains a good deal about the physiology of circulation, and it suggests what should be done in the case of all the common emergencies, such as shock, poisoning, and scratches.

DULL, CHARLES E. *Safety First and Last.* Henry Holt and Company, New York, 1938.

Although dealing largely with problems relating to the driving of automobiles, this volume covers the general subject of safety. Fire prevention and safety in the home, factory, and school, and on the playground are topics discussed in some of the chapters. Alcohol as a cause of accidents is considered in several different chapters.

EMERSON, HAVEN. *Alcohol: Its Effects on Man.* D. Appleton-Century Company, New York, 1934.

A distinguished physician tells what modern medicine has to say about the effects on man of the drinking of alcoholic liquor.

HALLOCK, GRACE T., and TURNER, C. E. *Health Heroes.* Metropolitan Life Insurance Company, New York.

Six booklets on the lives of health heroes charmingly told. These sketches are on Edward Jenner, Robert Koch, Florence Nightingale, Louis Pasteur, Walter Reed, and Edward Livingston Trudeau.

HEISER, VICTOR. *An American Doctor's Odyssey.* W. W. Norton & Company, New York.

A great American student of public health travels in foreign lands in his effort to help in conquering disease and in making the world a better and happier place in which to live. His book possesses rare charm, and his humor will provoke many a good laugh.

HERZLER, ARTHUR E. *The Horse and Buggy Doctor.* Paul B. Hoeber, New York, 1938.

Dr. Herzler gives us a picture of the frightful horror that the great mass of people had of disease, and the ups and downs of practicing medicine in the horse-and-buggy days.

KRUHM, ADOLPH. *How to Grow Vegetables and Berries.* Doubleday, Doran & Company, New York, 1936.

A very practical book on home gardening. It takes up such problems as how to go about making a garden, the starting of early plants, the care of the garden, fighting garden enemies, and useful hints for gardeners.

LAMB, RUTH DE FOREST. *American Chamber of Horrors.* Farrar & Rinehart, New York, 1936.

This is the story of the government's war to protect its citizens from impure, adulterated foods, the poisonous spray left on fruits, rancid and filthy butter, and the various rackets which have developed in America.

MCLEAN, BETH BAILEY. *Good Manners.* The Manual Arts Press, Peoria, Illinois, 1934.

Good manners help us to get along with other people, to win their good will, and to be successful. This little book has been written for boys and girls who want to know the mannerly thing to do at all times.

American Red Cross First-Aid Textbook. American Red Cross, Washington, D.C.

Contains the most important first-aid information. Illustrated. This is the standard work of reference on first aid.

The Book of Knowledge. The Grolier Society, New York.

An encyclopedia of general information with material on health and sanitation.

Boy Scout Handbook. Boy Scouts of America, New York.

This official guide for Boy Scouts tells how the many Scout activities may be carried out with health and safety.

Compton's Pictured Encyclopedia. F. E. Compton and Company, Chicago.

A very attractive set of reference books for general reference. Many of its articles will serve to enrich the content of this textbook.

Girl Scout Handbook. Girl Scouts, Inc., New York.

This is the official book for Girl Scouts. In connection with Girl Scout activities there are many excellent references to health and safety.

Hygeia—The Health Magazine. American Medical Association, Chicago.

Attractive illustrations, special articles relating to the home and community, and stories make this a most helpful source for health material. It would be a good habit to look over this magazine every month for further information connected with the units in this book.

Parents' Magazine. New York.

This excellent magazine is published chiefly in the interests of parents, but it contains much of value to all teachers from the nursery school and kindergarten to the high school.

The World Book Encyclopedia. W. F. Quarrie Corporation, Chicago.

This encyclopedia has many references which will help the reader to understand the text better. There are articles on food, infection, alcohol, and sanitation.

FOOD TABLE

FOOD	100-CALORIE PORTIONS
Apple, baked	½ large apple and 2 tablespoons juice
Apple, fresh	1 large apple
Applesauce	⅜ cup
Apricots, stewed	¼ cup
Asparagus, fresh	20 stalks
Bacon, cooked	4 small slices
Banana	1 large banana
Bean soup	¾ cup
Beans, baked	⅓ cup
Beans, string	2 cups
Beef liver	2.1 ounces
Bread (white, whole-wheat, or graham)	slice ½ inch thick from medium-sized loaf
Butter	1 level tablespoon
Cake, chocolate layer	½ small slice
Carrots, fresh	4 or 5 young carrots
Celery	4 cups of ¼-inch pieces
Cheese, American	1⅛-inch cube
Cheese, cottage	5½ tablespoons
Cheese, cream	piece 2 inches by 1 inch by ⅜ inch
Cherries, fresh, stoned	20 cherries ⅞-inch in diameter
Chicken, roasted	1 slice 4 inches by 2½ inches by ¼ inch

FOOD	100-CALORIE PORTIONS
Chocolate fudge	1-inch cube
Clams	6 to 12 clams, according to size
Cocoa	½ cup
Codfish, creamed	½ cup
Cod-liver oil	1 tablespoon
Cookies	1 cooky 3 inches in diameter
Corn bread	slice 2 inches by 2 inches by 1 inch
Cornflakes	½ cup with ¼ cup milk and 1 teaspoon sugar
Crackers, graham	2 crackers
Crackers, saltine	6 crackers
Cream, thin, 18 per cent fat	¼ cup
Cup custard	⅓ cup
Dates	4 dates
Doughnuts	½ medium-sized doughnut
Egg	1 large (average size contains 70 calories)
Farina, cooked	⅓ cup with ¼ cup milk and 1 teaspoon sugar
Figs	1½ figs
French dressing with salad oil	1½ tablespoons
Grapefruit	1 grapefruit
Ham	1 slice 4¾ inches by 4 inches by ⅛ inch

FOOD TABLE (*Continued*)

FOOD	100-CALORIE PORTIONS
Hamburg steak	cake 2½ inches in diameter, ⅞ inch thick
Honey	1 tablespoon
Ice cream	⅓ average soda-fountain portion
Jellies	1 tablespoon
Lamb chops, broiled	lean meat of 1 chop 2 inches by 1½ inches by ¾ inch
Lettuce	2 heads
Macaroni and cheese	½ cup
Maple sirup	1 tablespoon
Mayonnaise dressing	1 tablespoon
Milk	⅝ cup
Muffins	¾ muffin
Oatmeal, cooked	⅓ cup with ¼ cup milk and 1 teaspoon sugar
Olive oil	1 tablespoon
Onions, creamed	2 onions
Oranges	1 large
Peaches, canned	2 large halves and 3 tablespoons juice
Peaches, fresh	3 medium-sized
Peanut butter	1 level tablespoon
Pears, canned	3 halves and 3 tablespoons juice
Pears, fresh	2 medium-sized
Peas, fresh or canned, drained	¾ cup
Pineapple, fresh	2 slices 1 inch thick
Pineapple juice	⅔ cup
Potato salad	½ serving (1.7 ounces)
Potatoes, baked or boiled	1 medium-sized
Potatoes, mashed	½ cup (scant)
Potatoes, sweet	½ medium-sized
Prunes, stewed, sweetened	2 prunes and 3 tablespoons juice
Rice, steamed	¾ cup
Rice pudding	½ cup
Salmon, canned	½ cup
Sirloin steak, lean, broiled	slice 2 inches by 1½ inches by ¾ inch
Spinach, cooked	2½ cups
Sugar, granulated	2 level tablespoons (1 teaspoon = 20 calories)
Tapioca, cooked with apple	¼ cup
Tomato-and-lettuce salad	½ serving (2.7 ounces)
Tomatoes, canned	2 cups
Tomatoes, fresh	2 to 3 medium-sized
Turnips	2 cups (½-inch cubes)
Walnuts	8 to 16 nuts, according to size

HEALTH WORDS

This list contains words you will need to know in reading this book. Following the explanation of each word you will find the number of the page on which it is first mentioned in this book.

Accredited herd: a herd composed of cows that have been tested and found free of infection (p. 35)

Acquired immunity: immunity that is acquired, either by having an attack of a particular communicable disease or by being immunized, or vaccinated, against it (p. 184)

Addict: one who has formed the habit of taking a narcotic drug (p. 132)

Adulterant: something added to food to preserve it, to make it look more attractive, or to substitute a cheap ingredient for a more expensive one (p. 61)

Aëdes aegypti (mosquito): a kind of mosquito the female of which carries the virus of yellow fever from one person to another (p. 180)

Aeration: the process of exposing water to oxygen by spraying it into the air (p. 45)

Air-conditioning system: a system for ventilating and heating or cooling a building or other enclosed place (p. 15)

Allergy: extreme sensitiveness of the body to a protein in food or to animal hairs or plant pollens (p. 61)

Anemia: a condition caused when there are not enough red corpuscles in the blood or when the red corpuscles do not contain enough hemoglobin (p. 91)

Anopheles mosquito: a kind of mosquito the female of which carries the protozoon of malaria from one person to another (p. 177)

Antibodies: chemical substances manufactured by the body cells to fight disease germs or their toxins (p. 188)

Antibody serum: a serum containing antibodies, such as diphtheria antitoxin (p. 192)

Antidote: a remedy given to counteract, or work against, the effects of a poison (p. 242)

Antiseptic cleanliness: a state of cleanliness achieved by using an antiseptic to destroy or make harmless any germs that may be present (p. 209)

Antitetanus serum: a serum containing the antibodies that work against the toxin produced by tetanus germs (p. 248)

Antitoxin: a serum containing antibodies which work against the toxins produced by certain disease germs, such as those of diphtheria and scarlet fever (p. 65)

Aromatic spirits of ammonia: a mild stimulant to the heart and nervous system when given by mouth, one-half teaspoonful in a half glassful of hot water (p. 218)

Arsenic: a highly poisonous chemical used in plant sprays to kill harmful insects and parasites (p. 62)

Artificial respiration: a method of restoring breathing in a person who has stopped breathing; the method commonly used is the prone-pressure method (p. 225; see also the illustration on page 241)

Aseptic: not septic, that is, free of germs. Aseptic cleanliness means a state of cleanliness marked by the complete absence of germs (p. 209)

Asphyxiation: suffocation caused when the oxygen supply of the body is cut off (p. 235)

Asthma: a disease marked by difficult breathing (p. 75)

Bacilli (*singular*, bacillus): bacteria shaped like rods (p. 170)

Bacteria: one-celled plants, many of which are useful or harmless. One of the two principal groups of communicable-disease germs (pp. 44, 168)

Benzoate: a salt formed from benzoic acid (p. 63)

Benzoic acid: a colorless adulterant permitted by law for preserving food (p. 63)

Beriberi: a disease of the nerves caused by a lack of vitamin B (p. 92)

Birth certificate: a certificate signed by the attending physician stating the facts relating to a person's birth (p. 272)

Birth rate: the proportion between the number of babies born alive in a given period in a certain locality and the number of people alive in the locality at the middle part of that period (p. 259)

Birth registration: the public record made of a person's birth (p. 272)

Boric acid: a mild antiseptic for washing the eyes, used in a solution made with boiled water (p. 219)

Botulism: a serious form of food poisoning caused by a germ which produces a deadly toxin in canned foods that have not been properly sterilized (p. 61)

Bovine tuberculosis: a kind of tuberculosis which affects cows, the germs of which may be conveyed to human beings in milk (p. 49)

Bruise: an injury in which the outer layer of the skin remains unbroken, but the lower layers are damaged (p. 230)

Bubonic plague: a communicable disease, caused by the bubonic-plague bacillus, which was responsible for terrible epidemics until its cause and its manner of spreading were discovered (p. 166)

Calcium phosphate: a combination of calcium and phosphorus which is the principal ingredient of bones and teeth (p. 90)

Calorie: a unit for measuring the energy value of food. A large calorie is the amount of heat it takes to raise one pound of water four degrees Fahrenheit (p. 87)

Carbon monoxide: a deadly gas without color or odor which develops when common fuels do not burn completely (p. 237)

Carotene: a yellow coloring matter found in many plants, which is changed by the body into vitamin A (p. 92)

Carrier (of disease germs): a person who has in his body the germs of a communicable disease without having symptoms of the disease (p. 49)

Cellulose: the tough fibrous material of which the outer coats of grains, the skins and seed coverings of fruits, and the framework of the stems and leaves of all plants are composed (p. 91)

Central heating system: the system, composed of a furnace or stove, pipes, and radiators, by means of which heat is supplied to all the rooms of a building from a central source (p. 11)

Certified milk: raw milk certified by an officially appointed milk commission as reaching a high standard of purity and butterfat content (p. 35)

Cesspool: a cistern or tank connected with a drain to collect refuse flushed into it from sinks and water closets (p. 145)

Chemical closet: a toilet not connected with a drain, in which body wastes are disinfected with a chemical preparation (p. 149)

Chlorinator: a machine for feeding chlorine gas into water to be disinfected (p. 44)

Chlorine: a gas used to destroy harmful bacteria in water (p. 44)

Cholera: a serious communicable disease of the intestinal tract caused by a comma-shaped germ (p. 38)

Clinical thermometer: a thermometer used in taking the temperature of the body (p. 219)

Cocaine: a drug obtained from the leaves of the coco plant and used as a narcotic (p. 112)

Cocci (*singular*, coccus): bacteria shaped like little balls (p. 169)

Codeine: a narcotic obtained from opium, similar to morphine but weaker in its action (p. 131)

Communicable-disease contact: a susceptible person or animal who has been near enough to an infected person or animal to have caught the infection (p. 266)

Compound fracture: a fracture in which the broken ends of the bone push up through the flesh and skin (p. 209)

Concentrated cod-liver oil: cod-liver oil which has been refined in order to obtain the vitamins it contains in almost pure form (p. 93)

Contaminate: to make impure, especially to infect with disease germs (p. 49)

Contamination: the state of being impure, especially of being infected with disease germs (p. 46)

Convalescence: the period during which a patient is recovering from an illness (p. 216)

Death certificate: a certificate signed by the attending physician giving the facts relating to a person's death (p. 272)

Death rate: the proportion between the number of people who die in a given period in a certain locality and the number of people alive in that locality at the middle of the period (p. 259)

Death registration: the public record made of a person's death (p. 272)

Dehydrant: a substance which has the power to take water from another substance (p. 141)

Depressant: a substance that dulls or slows down body activity (p. 115)

Diagnose: to recognize a disease from its symptoms and signs (p. 265)

Dick test: a skin test to find out whether or not the person tested is immune to scarlet fever (p. 195)

Diffusion: state of being spread out in all directions, as the diffusion of light (p. 24)

Direct lighting: lighting furnished by a lamp with a shade open at the bottom (p. 25)

Disinfection (of water): a method of purifying water with a disinfectant, such as chlorine gas (p. 44)

Dry cleaning: the cleaning of articles with a fluid that evaporates rapidly (p. 145)

Dysentery: a communicable disease of the intestinal tract (p. 38)

Eczema: a disease of the skin marked by redness, itching, and the formation of crusts or scabs (p. 75)

Emetic: a substance which causes vomiting (p. 243)

Ethyl alcohol: the ordinary alcohol present in alcoholic beverages, such as whisky or beer (p. 114)

Expectation of life at birth: the number of years that a baby born at a certain time in a certain place may expect to live, according to the experience, extending over a number of years, of the people living in that place (p. 259)

Fahrenheit: the name given to the scale thermometer invented by Fahrenheit in 1714, which is commonly used in English-speaking countries. On this scale the freezing point is 32 degrees above zero and the boiling point is 212 degrees (p. 12)

Fatigue: a condition caused by the piling up of waste substances in the body and by exhausting the food supply of the muscles, as a result of working too hard or too long without rest (p. 119)

Ferment: a living organism, such as the yeast cell, which produces fermentation (p. 114)

Fermentation: the chemical changes brought about in any substance by the action of a ferment. In alcoholic fermentations the chemical changes are brought about in a sugar solution by yeast cells, the wastes of which are ethyl alcohol and carbon dioxide (p. 114)

Filter: a porous article or mass, such as a bed of sand or a porcelain dish, through which a fluid is passed to separate from it solid matter suspended in it (p. 44)

Filterable viruses: many communicable diseases are caused by filterable vi-

ruses. They get their name from the fact that they can pass through the finest filter. Much yet remains to be discovered about them (p. 167)

Filtration (of water): a method of purifying water by filtering it through sand (p. 44)

First-degree burn: a burn in which the skin is reddened but not blistered or broken (p. 233)

Food elements: the different materials in food which the body needs for heat and energy, building and repair, the regulation of the various activities, and the protection of health (p. 87. See the tables on pages 90–93 for the names of the different food elements, what they do for you, and the principal foods in which they are found)

Foot-candle: a unit of light defined as the intensity of light thrown on a perpendicular screen one foot away from a standard candle (p. 3)

Formaldehyde: a colorless gas with a sharp odor, sometimes used illegally to preserve milk (p. 63)

Fumigation: the act of using smoke, gas, or fumes for the purpose of disinfection (p. 265)

General anesthetic: a substance, such as ether, used to produce a deep sleep during which a surgical operation is performed without causing the patient pain (p. 206)

Grade-A milk: a grade of pasteurized milk which contains not more than 10,000 bacteria per cubic centimeter at the time of delivery (p. 35)

Grade-B milk: a grade of pasteurized milk which contains not more than 50,000 bacteria per cubic centimeter at the time of delivery (p. 54)

Harborage (for rats): places in buildings, such as the spaces between double walls, the spaces between floors and ceilings, and burrows in the dirt floors of cellars, where rats may hide and build nests (p. 176)

Hashish: a powerful narcotic drug obtained from the hemp plant (p. 134)

Hemoglobin: the red coloring matter, composed largely of iron, which gives the red blood corpuscles their power to transport oxygen to the body cells (p. 91)

Hemp: a plant cultivated for its tough fiber, which is also a source of the narcotic drug hashish (p. 134)

Heroin: a narcotic preparation obtained from opium (p. 131)

Hookworm: a parasite which lives in the intestine of human beings and may be found in the meat of animals that had the disease before slaughter (p. 71)

Hospital gangrene: the name given to an infection which once spread among the patients in hospitals because of a lack of knowledge about germs and how to keep them out of wounds (p. 206)

Hot-air system (of heating): a central heating system in which a building is heated by warm air entering through registers connected with hot-air pipes (p. 11)

Hot-water system (of heating): a central heating system in which a building is heated by the radiation of heat from hot water circulating through radiators (p. 11)

Humidifier: a special kind of water container used to supply the air of a room with moisture (p. 14)

Immune: protected against a particular disease (p. 184)

Immunity: the condition of not being able to catch a particular communicable disease (p. 167)

Immunize: to make a person immune to a particular disease (p. 184)

Incinerator: a special receptacle or a furnace in which solid wastes are burned (p. 145)

Incubation period: the time which goes by between the entrance of germs into a person's body and the time when they begin to cause the first actual symptoms of the disease (p. 259)

Indirect lighting: lighting furnished by a lamp with an opaque bowl placed under the light bulb (p. 25)

Infant diarrhea: an intestinal disease of infants, prevailing in summer, which may be spread by infected milk (p. 53)

Infant-welfare station: a place where mothers may go to receive the medical attention for their babies and the advice which will help to keep the babies well; sometimes called a well-baby clinic (p. 267)

Infest: to cause trouble by being present in large numbers (p. 172)

Inflammable: capable of being easily set on fire (p. 161)

Inhalator: a mechanical device for giving oxygen to a person who has stopped breathing (p. 240)

Insect-exterminator: anything used to kill insects (p. 172)

Intestinal disease: a disease of the intestinal tract, such as typhoid fever or dysentery (p. 38)

Isolate: to keep a person sick with a communicable disease away from other people (p. 211)

Isolation: keeping a person sick with a communicable disease away from other people under conditions that will prevent the spread of the germs causing the disease (p. 259)

Larva (*plural*, larvae): the form in which certain insects, such as mosquitoes, hatch from the egg; at this stage they look something like worms (p. 178)

Light meter: an instrument for measuring units of light in terms of foot-candles (p. 22)

Mantoux test: a test to find out whether or not the germs of tuberculosis have ever entered a person's body; tuberculin test (p. 187)

Marijuana: the dried leaves and flowers of the hemp plant which are smoked in cigarettes in order to obtain the effect of the narcotic hashish (p. 112)

Mechanical carrier (of germs): anything on which germs are carried from place to place (p. 171)

Mental hygiene: the science dealing with the health of the mind (p. 259)

Mentally defective: not having a sound mind (p. 127)

Microorganism: an organism so small that it can be seen only by using a microscope (p. 168)

Migraine: a kind of severe headache usually confined to one side of the head (p. 75)

Misbranding: the use of an untruthful or misleading label on anything offered for sale (p. 63)

Morphine: a narcotic obtained from opium (p. 131)

Narcotic drug: a drug which has a powerful dulling effect on the nervous system (p. 112)

Natural immunity: the immunity with which one is born (p. 184)

Nicotine: the principal narcotic drug in tobacco (p. 129)

Nicotinic acid: a substance, closely associated with vitamin G, which is present in many foods and which prevents and cures pellagra (p. 93)

Night blindness: a condition of the eyes which makes it impossible to see in dim lights, caused by a lack of vitamin A (p. 92)

Nobel prize for medicine: a prize awarded annually to the person, or persons, who have made the greatest contribution to medical science during the preceding year (p. 173)

Noninflammable: not capable of being set on fire (p. 161)

Novocaine: a preparation of cocaine used by doctors and dentists to deaden pain (p. 131)

Nutrition (science of): the science which deals with the study of food and its use in the body (p. 84)

Nutritive value: the value of a food determined by the amount of nourishment it contains (p. 97)

Occupational accident: an accident resulting from a particular occupation; as, cutting one's hand while sawing wood (p. 224)

Opium: a powerful narcotic obtained from the dried juice, or sap, of the opium poppy (p. 112)

Oxidize: when oxygen unites with another element, such as carbon, combustion takes place. To oxidize, therefore, means to unite with oxygen, that is, to burn (p. 115)

Paramecia (*singular*, paramecium): slipper-shaped protozoa frequently found in stagnant water. They do not cause disease (p. 157)

Parasite: a plant or animal living in, on, or with another plant or animal from which it obtains its food, shelter, etc. (p. 62)

Passive immunity: temporary immunity to a communicable disease acquired by receiving antibody serum, or antitoxin, from an immunized animal (p. 194)

Pasteur antirabic treatment: a treatment discovered by Louis Pasteur which keeps rabies from developing after a bite from a mad dog or some other rabid animal (p. 250)

Pasteurization: the heating of a liquid, especially milk, to a temperature of from 142 to 145 degrees Fahrenheit in order to destroy any harmful germs it may contain (p. 35)

Patent medicine: a special mixture of drugs that someone has secured the exclusive patent right to make and sell (p. 112)

Pediculosis: having head lice (p. 174)

Pediculus: the head louse (p. 174)

Pellagra: a disease caused by a lack of nicotinic acid in the diet (p. 93)

Pharmacist: a druggist skilled in making up medicines (p. 123)

Pigment: a coloring matter (p. 93)

Pneumococci (*singular*, pneumococcus): germs of the coccus family that cause pneumonia. There are more than thirty different kinds or types of pneumococci (p. 169)

Pollute: to make impure, especially by infecting with disease germs (p. 38)

Positive tuberculin test: a tuberculin test the results of which show that tuberculosis germs have at some time entered a person's body. It does not mean necessarily that the person has active tuberculosis (p. 187)

Pressure spot: a spot where an artery crosses a bone, to which pressure is applied to stop bleeding from that artery (p. 244; see also the diagram on page 246)

Procaine: a preparation of cocaine used by doctors and dentists to deaden pain (p. 131)

Prone-pressure method of artificial respiration: the method commonly used to restore breathing in a person who has stopped breathing (p. 240)

Protozoa (*singular*, protozoon): one-celled animals; the lowest forms of animal life known (p. 168)

Public-health nurse: a visiting nurse, employed by a health department or visiting-nurse association, who gives care to sick people in their homes and also helps to prevent disease by teaching well people how to keep well (p. 264)

Pupa: after the larva stage certain insects, such as mosquitoes, rest in a shell or skin; at this stage the insect is called a pupa (p. 178)

Quarantine: the act of keeping a person who has been exposed to a dangerous communicable disease away from other people in order to prevent the spread of the disease (p. 259)

Quinine: a drug used in treating people sick with malaria (p. 178)

Rabid: mad, that is, having rabies (p. 250)

Rabies: a disease caused by a virus that attacks the nervous system. Human beings contract it by being bitten by a dog or some other animal that has rabies. A dog with rabies is commonly said to be mad (p. 170)

Reportable disease: a communicable disease all cases of which must be reported to the health department (p. 263)

Reservoir: that part of a water-supply system in which water is stored (p. 40)

Resistance: the ability to resist, or overcome, the germs of a communicable disease (p. 186)

Respiratory disease: a disease of the air passages or the lungs. A cold is a respiratory disease (p. 10)

Rickets: a disease caused by a lack of calcium, phosphorus, or vitamin D (p. 90)

Sanitation: that science which seeks to procure and to maintain healthful surroundings (p. 144)

Schick test: a skin test used to find out whether or not the person tested is immune to diphtheria (p. 167)

Scurvy: a disease caused by a lack of vitamin C (p. 92)

Second-degree burn: a burn in which the skin is blistered (p. 233)

Self-medication: taking medicine on one's own responsibility (p. 113)

Semi-indirect lighting: lighting furnished by a lamp with a partly transparent bowl placed under the light bulb (p. 25)

Sensitive (to a substance): when one is always made ill by eating a certain food or by coming in contact with a certain substance, such as animal hair or pollen, one is said to be sensitive to that food or substance (p. 75)

Septic sore throat: a severe form of sore throat caused by germs of the streptococcus family (p. 47)

Sewerage system: a system for removing wastes from sinks and water closets by means of drains connected with sewer pipes located underground (p. 149)

Shock: a condition sometimes produced when a person has been injured in an accident (p. 218)

Simple fracture: a fracture in which the broken ends of the bone do not push up through the skin (p. 229)

Simple goiter: a swelling of the thyroid gland due to a lack of iodine in the diet (p. 91)

Span of life: the whole period of a person's life from birth to death (p. 275)

Spirilla: bacteria that are spiral or curved in shape (p. 170)

Spontaneous combustion: the setting on fire of a substance through the chemical action of the materials of which it is made up; as in the oxidizing of oily rags (p. 232)

Sprain: a condition caused by the sudden stretching or tearing of the ligament surrounding a joint (p. 230)

Staphylococci (*singular*, staphylococcus): disease-causing germs belonging to the coccus family, not so dangerous as streptococci (p. 169)

Statistics: facts about anything which can be stated in figures (p. 271)

Steam heating system: a central heating system in which a building is heated by the radiation of heat from steam circulating under pressure through radiators (p. 11)

Stimulant: a substance that speeds up body activity (p. 116)

Storage (of water): a method of purifying water by storing it in a natural or artificial reservoir (p. 44)

Strain: an injury to the muscles caused by sudden or severe stretching (p. 230)

Streptococci (*singular*, streptococcus): disease-causing germs belonging to the coccus family (p. 169)

Sulfanilamide: a recently discovered drug which is very useful in helping the body to overcome germs of the coccus family, especially those that cause blood poisoning and septic sore throat (p. 195)

Surgical dressing: a dressing for a wound put on with the same precautions that a surgeon would use to keep germs out of the wound (p. 247)

Susceptible: not having the ability to resist infection (p. 9)

Tannic-acid jelly: a preparation containing tannic acid (a substance that causes shrinking of the tissues) which is used for treating small burns (p. 219)

Tapeworm: a worm which lives as a parasite in the intestine of man and various animals (p. 71)

Tetanus: a painful and sometimes fatal infectious disease caused by the tetanus germ, which is often introduced into the body through a wound; lockjaw (p. 192)

Thermostat: a mechanical device for opening or closing automatically the damper of a heating furnace according to the temperature of the room in which the thermostat is placed (p. 13)

Third-degree burn: the most severe form of burn, in which the tissues are destroyed for some depth (p. 234)

Thyroid extract: an extract from the thyroid gland of animals (p. 137)

Tourniquet: a device for stopping bleeding, consisting of a bandage twisted tightly over a firm pad placed on the proper pressure spot (p. 245)

Toxin: a poisonous substance produced by disease germs (p. 64)

Toxin-antitoxin: a serum used to protect a person against diphtheria, made by mixing diphtheria toxin with diphtheria antitoxin so as to weaken the effect of the toxin (p. 195)

Toxoid: diphtheria toxin which has been made nonpoisonous by the addition of a chemical; used to protect a person against diphtheria (p. 195)

Trachoma: a chronic communicable disease of the mucous membrane lining the inner surface of the eyelids (p. 9)

Trichina: a small slender worm which, in the larva stage, lives as a parasite in the muscles of human beings, hogs, and many other animals infected with it (p. 65)

Trichinosis: a disease caused by the parasite trichina (p. 66)

Tubercle: a small lumplike formation caused by the presence of the bacilli of tuberculosis in body tissue (p. 186)

Tuberculin test: a skin test used to find out whether or not tuberculosis bacilli have ever entered the body of a cow (p. 49) or of a human being (p. 186)

Typhus fever: a communicable disease the germs of which are carried from one person to another by the body louse and also by the rat flea (p. 172)

Ultraviolet rays: certain short rays of the sun which enable the body to manufacture vitamin D when they shine on the bare skin (p. 10)

Vaccination: a term first used to describe inoculation against smallpox but now used to refer to any preventive inoculation (p. 167)

Vaccine: any substance used to give active immunity to a communicable disease (p. 183)

Vital statistics: facts about people that can be stated in figures (p. 259)

Voltage: a measure of electric current in terms of a unit of measure called a volt (p. 28)

Water-supply system: a system composed of everything connected with the conveying of water from a central source to the place where it is used (p. 38)

Wattage: amount of electric power expressed in terms of a unit of power called a watt (p. 23)

Wheat germ: the part of a grain of wheat which contains the living cell from which the wheat plant grows (p. 92)

Xerophthalmia: a soreness of the eyes caused by a lack of vitamin A (p. 92)

Yellow fever: a communicable disease, caused by a filterable virus, which is carried from one person to another by the female mosquito *Aëdes aegypti* (p. 166)

INDEX

Key to the Sounds

ā *as in* at	ē *as in* be	ō *as in* note
ā *as in* ate	ĕ *as in* her	ô *as in* horse
ȧ *as in* ask	ĭ *as in* bit	o͝o *as in* foot
ä *as in* father	ī *as in* bite	o͞o *as in* food
ĕ *as in* bet	ŏ *as in* not	ū *as in* use

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